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ABSTRACT

The title report of this publication contains the results of a 1993 study devised to ascertain the market share and geographic distribution of automated systems in Australian school libraries. Thirty-three surveys were distributed to vendors of automated systems known to have school library installations or to have recently developed a product for this market; 29 surveys were returned. Systems included were required to perform at least three functions: cataloging, online catalog (OPAC), and circulation. Survey results provide an overview of the Australian school library automation scene as well as a brief history and contact information for some of the most common systems available. It is anticipated that subsequent surveys will occur on an annual basis. The following three papers are also included: "Crucial Factors in Online Inquiry: OPAC Design for School Library Users" (Paul Drayton); "MARC for Teacher-Librarians: An Introduction" (Ellen Paxton); and "Providing Access to Fiction in School Libraries: Some Thoughts and Observations" (Ashley Freeman). Each paper contains references, and a 65-title select bibliography of school library automation is included. (DLS)

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School Library Automation in Australia

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2

SCHOOL LIBRARY AUTOMATION IN AUSTRALIA

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SCHOOL LIBRARY AUTOMATION IN AUSTRALIA

Issues and Results of the First National Survey

Edited by Ken Dillon

Centre for Information Studies

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Contents

List of Contributors vi

Introduction vii

School Library Automation in Australia: Results of the First National Survey 1
Ken Dillon

Crucial Factors in Online Enquiry: OPAC Design for School Library Users 23
Paul Drayton

MARC for Teacher-Librarians: An Introduction 41
Ellen Paxton

Providing Access to Fiction in School Libraries: Some Thoughts and Observations 63
Ashley Freeman

School Library Automation: A Select Bibliography 71
Ken Dillon

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Ken Dillon lectures in teacher-librarianship in the School of Information Studies at Charles Sturt University-Riverina. He was formerly a teacher and teacher-librarian in both government and non-government central and secondary schools in New South Wales. He edited *Collection development: Issues in selection for school libraries* (Sydney: ALIA School Libraries Section, NSW Group, 1991) and is co-author of *Survival strategies for teacher-librarians* 3rd edn. (Wagga Wagga, NSW: Centre for Information Studies, Charles Sturt University-Riverina, 1992) and *Brought to book: Censorship and school libraries in Australia* (Port Melbourne: DW Thorpe/ALIA Press, 1993). Currently he is co-editor (with Stuart Ferguson) of the Occasional Monographs Series for the Centre for Information Studies at Charles Sturt University-Riverina.

Paul Drayton

At the time of writing, Paul is a Senior Project Officer with the Information Technology Directorate of the NSW Department of School Education and is Module Leader for OASIS Library within the OASIS Project. After completing a BA Dip Ed in Teacher-Librarianship from Macquarie University, Paul was a teacher-librarian for 12 years at Merrylands High School in Sydney's western suburbs during which time his special interests included in-service development for teacher-librarians, information skills development and organising school library resources using microcomputers. In 1988 he was deployed to the Department's Management Information Services, as it was then known, to be part of the OASIS Project Team, assisting in the writing of user documentation and the training of school staff. As Module Leader for OASIS Library since 1990, Paul has overseen the implementation of Version 2 of the software into NSW government schools. In 1995 Paul is commencing a Master of Applied Science in Information Management to further his interest in information retrieval and interface design.

Ashley Freeman

Formerly a teacher, teacher-librarian and primary school principal with the NSW Department of School Education, Ashley lectures in teacher-librarianship in the School of Information Studies at Charles Sturt University-Riverina where his major teaching areas include children's literature and resource management. He is currently undertaking a PhD in educational history and is Assistant Editor of *Reading Time*.

Ellen Paxton

Ellen worked as both a classroom teacher and teacher-librarian in Victorian government secondary schools for six years. In July 1992, she joined the Information Services Department of the Curriculum Corporation in Melbourne as Cataloguing Coordinator. Ellen's main duties involve coordinating the SCIS (formerly ASCIS) database with a special emphasis on quality control. In the past twelve months, Ellen has been in charge of overseeing the conversion of the SCIS database from AUSMARC to USMARC.

Introduction

The main purpose of this first national survey of school library automation was to ascertain the market share and geographic distribution of automated systems in Australian school libraries. Whilst there has been a growing body of research regarding the impact of automated systems on the role of the teacher-librarian and on the educational programs offered by the school, Australian teacher-librarians and researchers have been hampered by a lack of basic data about automated systems in school libraries. The result has been the first national survey of vendors of library automation systems for school libraries. The results of the survey provide the reader with an overview of the Australian school library automation scene as well as a brief history of some of the most common systems available.

Additionally, three thought-provoking papers dealing with important issues relating to school library automation in Australia have been included. Paul Drayton from the NSW Department of School Education discusses the factors crucial in the design of online public access catalogues (OPACs) for school library users with particular emphasis on OASIS Library Enquiry. Ellen Paxton of the Curriculum Corporation explains the meaning of MARC and examines the importance of the MARC record for school library catalogues including the relationship between SCIS and USMARC, while Ashley Freeman tackles the thorny issue of providing improved access through OPACs to fiction material for school library users. Finally, a select bibliography of materials about school library automation is included.

It is anticipated that subsequent surveys of school library automation vendors will occur on an annual basis to reveal trends over time in the Australian marketplace. Future reports will continue to include papers which address topical issues relating to school library automation in Australia.

Ken Dillon, February 1995

School Library Automation in Australia: Results of the First National Survey

Ken Dillon

Introduction

The main purpose of this first survey of school library automation was to ascertain the market share and geographic distribution of automated systems in Australian school libraries as at 31 December 1993. Additionally, the survey was conducted in order to determine the range of automated systems available for the school library market in this country. The number of school libraries with automated systems has 'grown like Topsy' since school libraries first began to embrace the technology in the early 1980s. The heavy demands placed on teacher-librarians in a time of significant structural and technological changes in education in concert with the rapid pace at which automation of school libraries has proceeded have meant that teacher-librarians have experienced difficulties keeping a 'handle' on developments in the area. Which systems are recommended or preferred by educational authorities? Which are available on Macintosh, PC or some other platform? Where can vendors of automated systems be contacted? What factors are unique to the Australian scene? Answers to these and similar questions were not readily available to teacher-librarians. This paper seeks to redress this lack of basic data in an area which impacts greatly on the role of the teacher-librarian.

Characteristics of the market

A distinct characteristic of the school library marketplace in Australia has been the adoption by some of the major educational authorities of 'recommended' or 'preferred' systems for use in the schools which form a part of that system. Agreements between vendors and educational authorites governing the dissemination and use of automated system software vary greatly from situation to situation. In some cases, for example, the software was purchased 'as is', whilst in others the educational authority worked with the software vendor in the research and development phase of the final product for implementation in schools within the auspices of that authority. Table 1 lists recommended and preferred systems for school library automation by educational authority. All but one of the government school authorities 'recommend' or 'prefer' at least one PC-based system, with Victoria recommending as many as five. Four Catholic Education Offices also officially 'recommend' or 'prefer' one or more PC-based systems, with the Tasmanian CEO also recommending a Macintosh-based system (Mac'n Library).

Independent schools, which form the balance of the non-government school sector, leave the choice of automated systems to individual schools, although anecdotal evidence suggests that many independent schools are greatly influenced in their choice of system by the 'prevailing' or 'dominant' system installation in their local geographic area. Exceptions include large independent schools (such as GPS schools) which may have more complex requirements and small groups of school libraries with a common mission (e.g. 'church' schools which decide unofficially on a preferred system for use in its schools). The dominant system in Table 1 is OASIS Library, a fact reflected in a later section of this paper which deals with the total number of automated system installations Australia-wide.

Table 1: Recommended and preferred automated systems for Australian school libraries by educational authority

Name of Educational Authority	Preferred/ Recommended System(s)
Government Schools	
ACT Department of Education and Training	OASIS Library
NSW Department of School Education	OASIS Library
Northern Territory Department of Education	None
Queensland Department of School Education	OASIS Library
South Australia Department of Education and Children's Services	BookMark, Dynix Schools
Victorian Department of School Education	AIMS, Dynix Schools, Microfusion, OASIS Library, OCELOT Schools
Tasmanian Department of Education and the Arts	Dynix Schools, OASIS Library
Western Australian Ministry of Education	Microfusion
Non-Government Schools	
Catholic Education Office, ACT/NSW	OASIS Library
Catholic Education Office, Northern Territory	None
Catholic Education Office, Queensland	None
Catholic Education Office, South Australia	None
Catholic Education Office, Tasmania	BookMark,Dynix Schools, Mac'n Library
Catholic Education Office, Victoria	None
Catholic Education Office, Western Australia	Dynix Schools, ELM, Microfusion, OASIS Library, Ocelot Schools

The survey

This survey was concerned with installations of 'integrated' systems for school library automation. By 'integrated' is meant a system which combines using a single database for at least three of the usual five library functions – Cataloguing, Online Catalogue (OPAC), and Circulation. Acquisitions and Serials Control are the other two. According to this definition software which has been used in school libraries to automate individual routines have been excluded from this survey. These include catalogue card production software such as The Librarian's Apprentice and adaptations of applications software designed to fill a specific need, e.g. the Northern Territory Department of Education's AGAMA (eight sites) which runs on HyperCard for the Macintosh and has been designed specifically for use in small schools.

All systems included in the survey are microcomputer-based except for the DOBIS/LIBIS integrated library management system used by 21 schools in the Northern Territory as part of the LINNET library network. Australian vendor of DOBIS/LIBIS, IBM Australia Ltd, was not sent a survey as the original study design limited systems for inclusion to microcomputer-based systems. IBM Australia Ltd will be invited to participate in the

second national survey. Additionally, there are 14 schools using the minicomputer-based system URICA 2000. Government schools in Tasmania which were formerly using Starlite as part of the TASNET library network are now using Dynix as part of the TALIS (Tasmanian Automated Library Information System). Each school library in the network operates on an individual basis with its own paremeters. The only features common to all sites are that they each access the same computer and all share the same Dynix software and bibiliographic file. The 'conversion' of 32 schools from Starlite to Dynix took place over the 1993-94 Christmas break and these sites will be considered in the second national survey.

The 1993 survey was based on a combination of questions adapted from Lighthall's (1990-1993) series of surveys of the Canadian school library marketplace. A total of 33 surveys was distributed to vendors of automated systems known to have school library installations or known to have recently developed a product for the school library market. A total of 29 surveys was returned. In a letter, John O'Farrell explained that data about the Book Trak system were not provided as there were now '...less than a dozen institutions using the system' compared to the approximately 150 sites which used to exist. O'Farrell now concentrates only on supporting the remaining users and helping those who so elect with 'migrations' to other systems. Similarly, Allan Gilligan of Yaralla Computing elected not to complete the survey for the 'two or three' Electronic Library sites that exist. The company had made a conscious decision some time ago to concentrate on business solutions rather than on the education sector. John Devine of GUI Imagine supplied responses for both BLISS and Imagine on the same survey form. Finally, the survey sent to the last known address for the Hermes system was 'returned to sender' unopened and subsequent investigations failed to locate any contact information.

Responses to the 1993 survey indicate that at least 4276 Australian school libraries had automated systems installed by the end of 1993. The total number of schools in Australia is 9865 (*Schools Australia 1993*: 4). Therefore, approximately 43 per cent of Australian school libraries are automated. Of course, this figure assumes that all schools have a library. On the other hand, the actual percentage of automated school libraries would be higher when the number of 'home-grown' (non-commercial) systems was taken into account, when any small vendors not included in this study (i.e. unknown to the author at the time of the survey) had their installations counted, and if the number of Imagine and Winnebago sites could be included in the count (see below). Additionally, some vendors provided installation figures for the early part of 1994 which were not included in this study.

Every effort was made to maximise the integrity of the survey data. An important part of this process was the supply of 'client lists' by vendors for verification of reported numbers of school library installations of their system. Persistence in this area and an assurance of confidentiality of client details paid off as many client lists included special, public and even academic library sites. Some lists also included other types of educational libraries such as those in Teachers' Centres, Educational Resource Centres and other educational support sites. For the purposes of this survey, 'schools' were defined as individual sites whether administratively part of a school cluster/region or not. They include public schools, parochial schools, private schools, and independent schools providing education at any year level, from Kindergarten to Year 12.

Careful attention was paid to stripping client lists of sites which fell outside the above definition in order that the previously embedded list of school library installations for each system was laid bare. Only two of the 29 surveys returned did not include a client list. John Devine stated that it was his company's policy not to divulge client lists except to say that '...1993 saw the completion of conversion of BLISS...to Imagine.' Devine reported a total

number of ten BLISS sites and two Imagine sites at the end of 1993. Alan Selby of Educational Media Supplies, which is the Australian distributor of the Winnebago systems, stated that, 'It is Winnebago policy not to divulge sites except to say over 100 sites [school *and* special libraries] exist in Australia of which approximately 20 per cent are located in NSW.'

The percentage of automated school libraries in Australia compares favourably to that in other countries such as Canada where Lighthall (1994) estimates that '...about 35 per cent of Canadian school libraries are automated.' Part of the reason for this slightly lesser percentage of automated school libraries in Canada may be contextual factors. In Canada, there are ten provinces and two territories (Lighthall combines the territories in her analyses). Even though education in Canada is a provincial responsibility, the responsibility for selection of automated systems lay at the school district or individual school level. In Australia, the system of 'recommended' and/or 'preferred' systems (which has both its supporters and detractors) has resulted in an acceleration in the speed at which school libraries have become automated; for many schools the need to conduct a series of system evaluations and to write submissions for funding was negated by (for example) the supply of software free of charge already mounted on a hard disk and ready to go. In fact, in the case of NSW, Drayton (1994) estimates that *all* 2219 government schools in that state will be automated by mid- to late 1995. This is a realistic goal in light of the new funding for OASIS Library in small schools and when it is considered that at the end of the 1993 calendar year the Information Technology Directorate of the NSW Department of School Education estimated that only 42 schools with enrolments of 300 or more were yet to receive OASIS Library.

The vendor visits and software trials

So as not to conduct the entire research project 'from a distance', visits were made to a number of vendors and 'trade shows' to talk to the developers/distributors of library automation software. This technique proved to be most beneficial in supplying added depth to the data supplied in the vendor surveys. In addition to familiarity with the vendor's product as it is now, current developments in terms of software and markets, future directions for the company and concerns and issues in the school library automation market were the main topics for discussion on these visits. It is anticipated that visits to additional vendors will take place for surveys subsequent to this one. In 1994 the following vendors were visited: AIMS (Concord Data Solutions), Book Mark (South Australian Department of Education and Children's Services), Dynix for Schools (Dynix Australia), Libraries 2000 (Ferntree Computer Corporation), MOLLI (RAECO Technologies), OASIS Library (Softlink Australia) and Ocelot for Schools (Ferntree Computer Corporation). Additionally, visits were made to two key organisations in the current school library automation scene: the Curriculum Corporation in Melbourne as the supplier of almost all retrospective data for the conversion of card catalogues to automated catalogues, and the Information Technology Directorate of the NSW Department of School Education as the administrators of the largest single school library automation project of which this writer is aware. Finally, some vendors supplied 'demonstration' software with their returned surveys.

The responses

Table 2 shows the functions/modules available for systems reporting Australian installations and for four systems which have demonstrated their intention to break into the Australian market by the establishment of test or 'pilot' sites in schools. The common element in all of the systems listed is the integration of Cataloguing, OPAC (Online Public Access Catalogue) or 'Enquiry', and Circulation modules. After that, there is a wide variety of scope including the possibility of adding Acquisitions and Serials modules and a wide

selection from a smorgasbord of automated extras including report generation, graphical OPAC interfaces, access to bibliographic databases such as Guidelines and SAGE (Science and Geography Education) and textbook and/or separate system administration modules. Of course, the list of 'extras' should be consulted with caution as some vendors went into more detail than others in response to this question. Also, whilst options like statistics and stocktake are separate modules for some systems, these capabilities are 'built-in' to the existing base modules for others.

Table 2: Functions/modules available by system

System Name	CAT	OPAC	CIRC	ACQ	SER	OTHER
AIMS	√	√	√	√	√	1,2,3,4,18,25
Biblios	√	√	√		√	
BLISS	√	√	√	√		1,5
Book Mark	√	√	√		*	1,3,4,5,6,7,8
Book Plus	√	√	√	√	√	3,4,5,28
Book Worm***	√	√	√			1,5,9
Books	√	√	√	√		1,5
CSL Library	√	√	√	√		1,5
DOBIS/LIBIS	√	√	√	√	√	1,3,4,23
DataTrek School Series***	√	√	√			8,11,12,26
Dynix Schools System	√	√	√	√		13,14
ELM	√	√	√	√	√	1,5,18,26
Imagine	√	√	√	**	**	2,5,15
Inmagic Plus***	√	√	√	√	√	
Integrated Library Management System	√	√	√	√		1,3,5,28
Libraries 2000	√	√	√	√	√	1,3,5,23,26
Mac'n Library	√	√	√	√	√	27
MacBee Library System	√	√	√	√		5,16
Metamarc	√	√	√	√	√	1,5,17,18,26
Microfusion	√	√	√	√	√	1,5,18,23
MOLLI	√	√	√	√	√	5
MUSAC Library	√	√	√	√		1,2,3
OASIS Library	√	√	√	√	√	1,6,9,15,19,21, 23,24,26
Ocelot for Schools	√	√	√	√	√	1,3,19,26
PC School Library	√	√	√	√		2,5
Prolib	√	√	√	√		1,3,5
ROS Library System	√	√	√	√	√	20,21
SIRCAT II	√	√	√			4,5,29
URICA 2000	√	√	√	√	√	1,22,26
Winnebago	√	√	√	√		1,2,3,5,20

NOTES:

* Planned for late 1994
** Planned for mid-1994
*** No school library installations as yet and/or test sites established.

KEY:

1. Report generator
2. Student data import
3. System administration
4. Statistics
5. Stocktake
6. Standalone public access (for use on separate terminals located elsewhere in the school)
7. Access management to other software on the same hardware
8. An 'advanced' OPAC/searching system
9. Textbook management
10. Reserve book room; Material booking
11. Databridge (MARC conversion)
12. School GoPAC (graphical OPAC); School MARC archive (full MARC archiving)
13. Other modules such as Serials Control, Media Scheduling, SAGE database and Community Resources can be incorporated into the Schools System if desired.
14. Kid's Catalog (graphical OPAC)
15. Imaging
16. Data selection from a supplied database of 11000+ books; Batch processing of new materials from other PCs.
17. Thesaurus
18. Budgeting/Finances
19. User defined codes
20. Remote stocktake
21. Multi-user CD access
22. Reserve collection; Requisition; Database load
23. Communications
24. Other modules such as Rapid Retrospective, Self Circulation, Guidelines database and Advance Bookings can be incorporated into the system if desired. A more compact version of the main system (Baby OASIS) is available to primary schools.
25. Text scanner; Assignment register; Table of contents (allows cataloguing of contents of items eg poems, songs); Assets register
26. Authority control
27. Reserves; Data utilities
28. ABN and Z.39 interfaces; Record import/export; SDI; Offline circulation and OPAC; Community Information
29. Limited borrower version available at reduced price.

Of the 30 systems listed in Table 2, 14 are MS-DOS systems, 7 are Unix-based, 2 are Macintosh-based, 2 use PICK, 2 are available for PICK and UNIX, 1 is available for MS-DOS and Macintosh, 1 for MS-DOS and UNIX and 1 for DOS/VSE, MVS platforms. Table 3 indicates which operating system(s) are used by each product as well as reported availability of a MARC facility.

Table 3: Operating system and availability of MARC facility by system

System Name	MS-DOS	UNIX	MAC	PICK	OTHER	MARC CAPABLE?
AIMS #		√				YES
Biblios		√				YES
BLISS		√				YES
Book Mark	√					YES
Book Plus		√				YES
Book Worm	√					NO
Books	√					NO
CSL Library			√			YES
DOBIS/LIBIS					DOS/VSE, MVS	YES
DataTrek School Series	√					YES
Dynix Schools System #		√		√		*
ELM				√		YES
Imagine ##		√				YES
Inmagic Plus	√				VAX/VMS	**
Integrated Library Management System	√	√				YES
Libraries 2000		√				YES
Mac'n Library			√			YES
MacBee Library System	√					YES
Metamarc #		√			XENIX	YES
Microfusion				√		***
MOLLI	√					YES
MUSAC Library	√					YES
OASIS Library	√					YES
Ocelot for Schools	√					YES
PC School Library	√					YES
Prolib	√					YES
ROS Library System	√					YES
SIRCAT II	√					****
URICA 2000		√		√		YES
Winnebago	√		√			YES

NOTES:

* Standard software supplied to schools can load MARC records but does not have full MARC editing available as in the fully featured version of the software

** MARC records need to be converted before download/upload

*** Can accept MARC stored in special format. Full MARC capability under development

**** Reads ASCIS80 format data

\# Runs on UNIX and/or XENIX as a server to MS-DOS, WINDOWS or MAC under terminal emulation

Imagine is a complete re-write of UNIX based BLISS to run in a WINDOWS environment on LANS using WINDOWS NT, WINDOWS NT AS and UNIX OBDC compliant file servers

Automated systems in school libraries: market share 1993

Readers are reminded that a system of 'recommended' or 'preferred' automated systems for school libraries exists in some Australian educational authorities. Whilst some schools in these educational systems have 'gone their own way', the majority have adopted their educational authorities' recommendation. As noted earlier, many schools find the 'offer' too good to refuse when a combination of educational authority tested and trialled library automation software is offered to the school free of charge with training and support. Some teacher-librarians have 'migrated' their systems from the original to a recommended or preferred system as a result of these and other attractions (such as the existence of an active local users' group) and sometimes due also to disenchantment with the current system in use.

There can be no doubt that the high installation figures for some systems are due in no small part to the inclusion of these systems on the recommended/preferred lists of educational authorities. A number of vendors spoke of the often quite rigorous tender processes in which they had been involved. Some vendors considered the school library market to be a 'closed shop' and have concentrated on other markets, most notably in the area of special libraries and small public libraries. Alan Selby of Winnebago expressed '...concerns about the lack of freedom in the market and a lack of understanding about what is required in a library system to protect the data'. In his response, Ray Howell of Correlations (developer of Prolib) commented that:

> Innovation in software comes about when there is an open competitive market. This is to the advantage of the schools and to the Australian software industry. As Prolib was never packaged as a glossy product it may well have remained as a small player in the marketplace but there would be far better products now available if the market was more open.

There may be other reasons for vendors not participating in the tender process. Julie Rae of RAECO Technologies calls MOLLI an 'off-the-shelf' product: 'RAECO are unable to offer technical support for the system although support is available to users in Western Australia where the greatest number [8] of installations exist.' Competition in the school library automation marketplace is clearly fierce, and it quickly becomes evident that some vendors are not only struggling to establish new sites but are also battling to maintain their existing installations. Table 4 lists total installations of automated systems in Australian school libraries in descending order. The first numerical column shows the actual number of installations of each system Australia-wide as at 31 December 1993. The second column indicates the percentage market share of each of the automated systems. The reader is reminded that these figures indicate *school library installations only*.

Table 4: Total number of installations and percentage market share of automated systems in school libraries as at 31 December 1993

Automated System	Total Installations	Market Share (%)
OASIS Library	2067	48.3
Book Mark	616	14.4
Ocelot Schools	318	7.5
Microfusion	307	7.2
Dynix Schools	245	5.7
Prolib	137	3.2
AIMS	87	2.0
CSL Library	72	1.7
Metamarc	68	1.6
SIRCAT II	67	1.6
Mac'n Library	64	1.5
PC School Library	61	1.4
MacBee	31	0.7
Books	26	0.6
DOBIS/LIBIS	21	0.5
ELM	19	0.5
MOLLI	16	0.4
Libraries 2000	14	0.3
ROS Library System	14	0.3
URICA	13	0.3
Other*	13	0.3
Total	4276	100.00

* Consists of: Integrated Library Management System (6); BookPlus (3); BookWorm (2); Biblios (1) and MUSAC Library (1).

OASIS Library: a special case

From Table 4, it is obvious that OASIS Library dominates the school library automation marketplace in Australia. Originally developed by Softlink Australia as ALARM in the mid-1980s, the software was re-developed as OASIS in 1988 following Softlink's successful tender to develop and supply school administration and library automation software to the NSW Department of Education in the previous year. In the early 1990s, OASIS was successfully marketed in New Zealand, Europe (where it is known as ALICE) and in Iceland (where it is known as EMBLA). By the end of 1993, there were approximately 2000 libraries of all types using OASIS, ALICE or EMBLA overseas.

The following tables provide a more detailed breakdown of the distribution of OASIS Library installations throughout Australia.

Table 5 : Total OASIS Library installations in Australia to 31 December 1993 by source of software

OASIS LIBRARY - TOTAL INSTALLATIONS (Australia)	
Supplier/Educational Authority	Number of Installations
SOFTLINK	264 (excludes ACT, Qld and Vic state schools)
ACTDE&T	47*
NSWDOSE	1038
QLDDOSE	265*
NSW/ACT CEO	257 (excludes schools supported by Softlink)
VICDOSE	186*
TASDOSE	10
TOTAL	2067

* Softlink installed and supported

Table 5 shows that about half of the 2067 OASIS Library sites established to the end of 1993 are within the NSW Department of School Education. The Department has recently negotiated a state licence for the installation of Version 2.0 of the OASIS Library software in existing sites and the provision of this latter version of the software to '...some 996 small schools with less than 300 students...currently ineligible for OASIS Library' (New South Wales Department of School Education, 1994). Additional funding to assist these small schools with the retrospective conversion of their cataloguing records using SCIS will also be available (McLaren, 1994: 2-3). It is anticipated that by the end of 1995, all school libraries within the NSW Department of School Education will be automated. The number of installations is set to increase even further in 1994 when it is considered that the Tasmanian Department of Education and the Arts purchased a statewide licence for OASIS Library during 1993 which should result in a rapid growth in the number of primary school sites in that state above the 10 currently installed. Training and support for OASIS Library in Tasmanian government schools is supplied by the Department's Library Support Service which also provides the same assistance to the state's Dynix users (predominantly secondary schools).

In ACT, Queensland and Victorian government schools, the software licensing agreement for OASIS Library currently involves Softlink installation and support. In the ACT, where OASIS Library has been the 'preferred' system since 1990, each school library is a direct client of Softlink and is provided with telecommunication/facsimile support and annual training for a fee. Where possible, additional assistance to schools has been provided by the officer in charge of School Library Services on an 'unofficial' basis. In Queensland, the arrangement (from early 1994) is that government schools wishing to automate should purchase OASIS Library, although those schools already automated with alternative software may retain that software. Training and support are provided directly to schools by Softlink. OASIS Library is one of five automated systems on the current library automation contract for Victorian government schools where Softlink have two agents, one in Melbourne and one in Ballarat.

In systemic Catholic schools administered by the NSW/ACT Catholic Education Office authorities, OASIS Library is made available to all schools within the auspices of

participating dioceses. At the end of 1993, a total of seven out of 11 dioceses was actively participating in this arrangement. Training and support are provided at the diocesan level. Some schools are directly supported by Softlink (mostly sites installed prior to CEO agreements with Softlink). Schools with OASIS Library in the remaining four dioceses are almost always Softlink installations.

Table 6 : Total OASIS Library installations in Australia for the period 1 January 1993 to 31 December 1993 by source of software

OASIS LIBRARY - 1993 INSTALLATIONS (Australia)	
Supplier/Educational Authority	Number of Installations
SOFTLINK	39 (excludes ACT, Qld and Vic state schools)
ACTDE&T	6*
NSWDOSE	103
QLDDOSE	102*
NSW/ACT CEO	86 (excludes schools supported by Softlink)
VICDOSE	33*
TASDOSE	10
TOTAL	379

* Softlink installed and supported

Table 7 : OASIS Library: Best year for installations in Australia by source of software

OASIS LIBRARY - BEST YEAR FOR INSTALLATIONS (Australia)		
Supplier/Educational Authority	Year	Number of Installations
SOFTLINK	1990	53* (excludes ACT, Qld and Vic state schools)
ACTDE&T	1991	14
NSWDOSE	1992	339
QLDDOSE	1993	102
NSW/ACT CEO	1993**	86
VICDOSE	1991	41
TASDOSE	1993	10

* Note also that 80 Softlink sites were installed up to but not including 1990.

** Five dioceses reported 1993 to be their best year (Total = 86), while two reported 1992 (Total = 68).

A total of 379 new OASIS Library sites were recorded for the 1993 calendar year with over 200 installed in NSW and Queensland government schools. Overall, 1993 was also the best year for installations of OASIS Library in terms of numbers of new sites in

Queensland government schools, Tasmanian government schools and in the NSW/ACT Catholic Education Offices. In ACT and Victorian government schools, 1991 saw the biggest growth in numbers of sites in any one year, whilst in NSW government schools, 1992 was a significant year.

Table 8: Total OASIS Library installations in Australian schools by state/territory as at 31 December 1993

State/ Territory	Softlink Sites	Government School Sites	Catholic Education Office Sites	Total
ACT	10	47	18	75
NSW	85	1038	239	1362
NT	26	-	-	26
QLD	81	265	-	346
SA	10	-	-	10
TAS	2	10	-	12
VIC	40	186	-	226
WA	10	-	-	10
	264	1546	257	2067

Table 9: Total OASIS Library installations in Australian schools by state/territory for the period 1 January 1993 to 31 December 1993

State/ Territory	Softlink Sites	Government School Sites	Catholic Education Office Sites	Total
ACT	-	6	12	18
NSW	9	103	74	186
NT	4	-	-	4
QLD	14	102	-	116
SA	-	-	-	0
TAS	-	10	-	10
VIC	8	33	-	41
WA	4	-	-	4
	39	254	86	379

Table 8 provides the reader with a breakdown of OASIS Library installations across Australia by state/territory regardless of source of software or licensing arrangments/agreements between Softlink and educational authorities. Table 9 provides the same information for the 1993 calendar year.

Newcomers to the market

Despite the dominance of OASIS Library in the Australian school library marketplace in terms of number of installations, a number of 'new players' have also come into the market. These new players include Biblios (formerly Concorde Library Management System) from Qantel, Book Worm from Orana Home and Business Centre, Datatrek Schools Series from Datatrek, Imagine (formerly BLISS) from GUI IMAGINE, Libraries 2000 (formerly INFOMARC) from Ferntree and MUSAC Library from Nutshell Technologies. While Biblios, Imagine and Libraries 2000 are re-developed and upgraded versions of earlier software, Book Worm is a totally new product on the market. The Datatrek Schools Series originates from the United States and is one of a number of versions of the software available for libraries (the others are 'Manager Series' and 'Professional Series'). The Schools Series is installed in about 400 school libraries worldwide (Oxley and Whitby, 1993: 29). MUSAC Library has its origins in New Zealand and was developed as part of the Massey University School Administration by Computer software. There are approximately 400 school and college users of the software in New Zealand and another 400 in other countries including the United States and various Pacific nations (New products, 1994: 45).

Leaders in the market

Figures 1 and 2 show total installations of automation software in school libraries as well as 1993 installations *excluding* OASIS Library sites which have been treated separately in a previous section of this paper.

Figure 1: Percentage of market share of automated systems in school libraries excluding OASIS Library

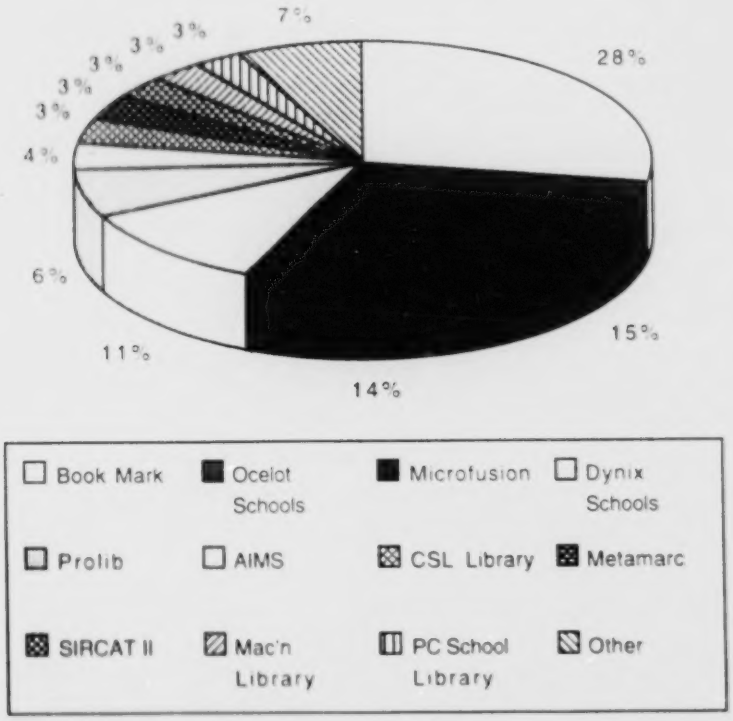
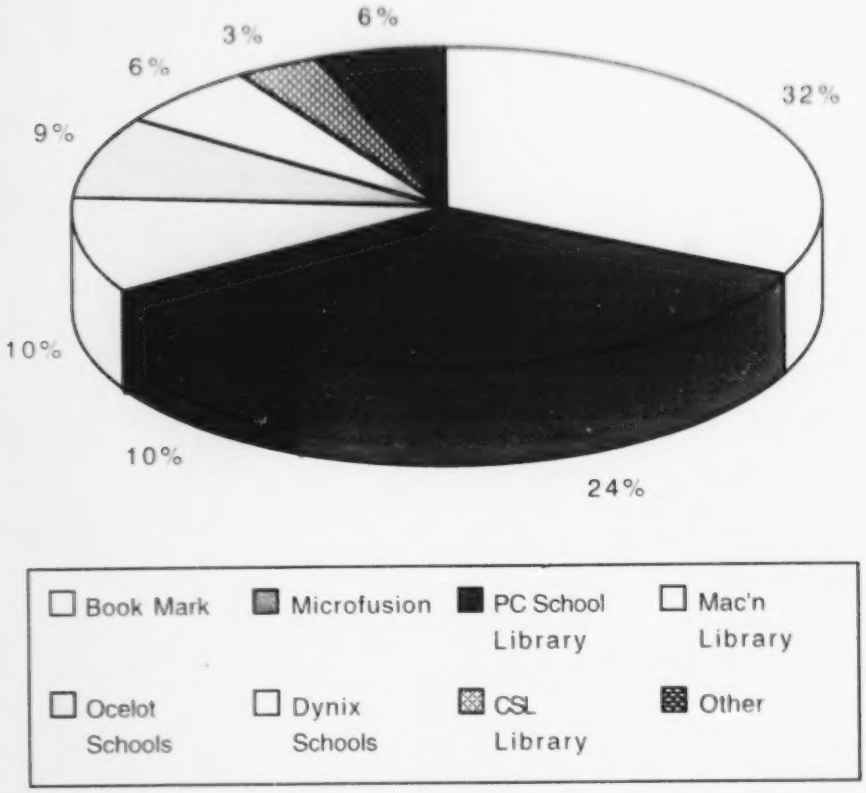


Figure 2: Percentage of school library installations of automated systems for 1993 excluding OASIS Library



When OASIS Library sites are discounted, Book Mark, Ocelot for Schools, Microfusion and Dynix Schools account for 68 per cent of the remaining school library installations between them. Development of Book Mark began in 1987 but the software was not released until 1989. It is produced by the South Australian Department of Education and Children's Services and was originally produced to meet the needs of South Australian primary schools in need of a low price system for library automation. At the time of writing, the latest version of Book Mark under development is 9.2 which is due for release in early 1995. Dean Hodgson, software developer for Book Mark, reports that this latest version (which represents a minor upgrade) will include several new features including mouse controls, an author authority system, new reservations system and a new facility for importing the new SCIS data format. Additionally, the development of version 10 of the software (tentativelly called Book Mark for Windows) is under way and, Hodgson reports, will not be due for general release until at least 1996.

The Ocelot Library System for PCs is a DOS-based package available in two versions, Ocelot for Schools and Ocelot for Specials, and is most suitable for libraries holding 1000 to 100,000 titles. In Europe and Canada (where the system was first developed in 1984), Ocelot has been marketed as the Columbia Library System since 1987 (Clyde, 1993: 49). In Australia, New Zealand and Papua New Guinea, Ocelot has been marketed and supported by Ferntree Computer Corporation since 1985. Ferntree also markets and

supports a UNIX-based library management system called Libraries 2000. A major development at Ferntree has been the finalising of an agreement with MARCorp Systems to market and support the Voyager Library Series in Australia.

The development of the Microfusion Information Management System began in Victoria in the mid-1980s with the software becoming generally available in late 1990-early 1991. Marketed and supported by The Education Company Australia, the product made its presence felt in the marketplace in June 1991 when the Western Australian Ministry of Education chose Microfusion as its preferred system for the following five years. Current developments include a re-positioning of Microfusion's software platform to enable full connectivity with UNIX, PICK, MS-DOS and WINDOWS NT. It was anticipated that this re-development would be completed during the latter half of 1994.

The Dynix automated library system is available in a number of versions including Dynix (fully featured system), Dynix Marquis and Dynix Scholar (now known in Australia as Dynix Schools). Dynix began development in Provos, Utah in August 1983 and opened its Australian office in Adelaide in 1986. Recent developments with Dynix include the availability of the SAGE (Science and Geography Education) and Guidelines (periodical index) bibliographic databases. Other new software includes PAC PLUS (Remote User Access) and Community Resources and Media Scheduling modules. Originally developed by CARL Systems of Denver Colorado in cooperation with the Denver Public Library, Kid's Catalog is a graphical user interface for OPAC's which has been designed specifically for use by children. It combines a colourful click-and-point pictorial interface with thousands of subjects and subdivisions designed specifically for young users. The first Kid's Catalog was installed at Redcliffe City Council Library in Brisbane where it is currently being trialled.

The middle ground

The next biggest group of installations (about 25 per cent of the market share excluding OASIS Library) is that which includes Prolib, AIMS, CSL Library, Metamarc, Sircat II, Mac'n Library and PC School Library. Originally developed for the Apple computer by Ray Howell in 1980, Prolib was one of the first school library automation systems to gain wide acceptance among teacher-librarians. While the first two versions of the software were developed for the Apple, there have subsequently been five major releases for IBM PC with Version 6.0 currently being trialled in a Tasmanian school. Most existing Prolib sites are currently running Version 3.0 of the software with adoption of later versions on the mainland to be determined by the two companies that sell and support the system: AVR Systems (Melbourne) and Infotech Education Services (Sydney).

The AIMS system was developed in Australia for the school library market although it is gaining increasing recognition in the special library market as well. The system has a number of distinctive features of interest to teacher-librarians including an 'assignment register' which allows staff to record assignments which students can then locate through the OPAC. The notes field allows for specific instructions or detailed information about finding resources. The 'table of contents' provides the facility to catalogue contents, whether individual programs in a series or on a tape, or poems, short stories or essays in a collection or anthology. A scanning feature called AIMSimage provides the means for storing text and images and would be particularly useful for vertical file management.

Available in either single-user or multi-user versions and originally developed in Canada, CSL Library (formerly MacSchool Library) is one of three Macintosh-based systems currently available to Australian schools (the others are Mac'n Library and Winnebago Circ/Cat for Mac). The software can be purchased as a 'stand-alone' system or in

conjunction with the MacSchool Student Information System. The current version of the software can handle up to 65,000 items and 5000 users. A new version was due for release in mid-1994 containing a number of (mainly technical) enhancements including improved interface with MacSchool, even faster search speeds, unlimited user reservations, better circulation window and more flexibility in defining user ID numbers and data fields.

Like Prolib, Metamarc (formerly MICMARC) is a pioneer of the Australian school library marketplace. Developed in 1980 in Victoria by Ewan Board for use in school and other small libraries (Clyde, 1993: 85), Metamarc was purchased by Microskil Pty Ltd in late 1993 after a period of consolidation of the system's user base by the previous owners. The current software is Version 10 with the next major release anticipated in late 1994. This later release of the Metamarc software will comprise a complete re-design and re-write of the management module for the administration of serials, acquisitions and budgeting. Many of the enhancements to be included in the new management module incorporate suggestions from the Metamarc National Users' Group. Extended capabilities for the external database access facility are also under consideration.

Sircat was originally developed as an Apple computer system in the mid-1980s by the Melbourne Apple dealer Computer Knowledge. Sircat II was also originally intended for the Apple computer but moved to MS-DOS when MicroPower purchased the product in mid-1990. The system can handle up to 65,000 records. A highly compact file structure is used so that the software comes installed on an 'easily large enough' 44 Mb hard disk. In excess of 40 of the current users of the system who were originally running the Apple version of the software have since upgraded to the MS-DOS version.

Another Macintosh-based system for automation of school libraries in Australia is Mac'n Library. Developed in Melbourne by the Tailor-Made Database Company in 1992, this system was designed as a 'low cost alternative to traditional PC systems' on a platform with little representation in the school library marketplace. The system will import ASCISRECON files and student records from the Victorian Department of School Education's CASES program. A 'catalogued collection of book records and a collection of approximately 2,500 SEE and SEE ALSO cross references' are also available for purchase separately or ready-installed on the hard disk at the time of installation. A student (modified) version of the system is also available which prevents student access to the 'insertion and deletion' functions of the program. The student version can be run on a stand-alone Macintosh or on a network using a separate single user version of Omnis and its own data file.

The library module of PC School was developed in 1989, three years after the release of the original PC School administration program. PC School Library can be integrated with PC School or used as a stand-alone system. An interesting feature of PC School is a stratified pricing structure where the cost of the whole system or any of its stand-alone modules is calculated on the basis of the school's enrolment. The aim of this pricing structure is to make the software an affordable option for small as well as larger schools. PC School Library was developed in Rockhampton, Queensland by Com-Assist Solutions.

In terms of the percentage of new installations in the 'middle ground' category in 1993, Book Mark (32 per cent) and Microfusion (24 per cent) are clear leaders, followed by a group of systems including two Macintosh-based systems (Mac'n Library – 10 per cent, and CSL Library – 3 per cent) and two 'established' systems in Ocelot Schools and Dynix Schools. It is interesting to note that CSL Library and PC School Library (with 13 per cent of new sites between them) were the only systems not to be included on the recommended or preferred lists of educational authorities (see Table 1). There is clearly a major advantage

for vendors in terms of numbers of new installations in remaining competitive in the tendering process for school library automation software with educational authorities.

The remaining systems

The final group of installations (about 6 per cent of the school library market share excluding OASIS Library) is that which includes MacBee Library System, Books, ELM, MOLLI, Libraries 2000, ROS Library System, URICA, Integrated Library Management System, BookPlus and those systems previously discussed under the heading 'Newcomers to the market'. Specifically developed in 1988 for the primary school market by Triple R Software Services, the MacBee Library System comprises cataloguing, circulation (by barcode reader), enquiry and stocktaking modules. Additionally, 'over 11,000 items from picture story book, fiction and non-fiction areas are supplied on disk for transfer to your school's library database.' All 31 MacBee Library sites are located in Victoria. Version 4.0 of the software is due for release in late 1994 and will include a number of enhancements, most notably a MARC facility.

All but one of the 26 Books sites are also located in Victoria. Sometimes referred to as the Sandhurst Computer Services Library System (after the company which developed the system in 1989 as part of a school administration package), the Books software is ASCISRECON compatible. Keyword searches by title, author, subject, etc. are possible as is the production of a range of reports such as borrower statistics, various lists (e.g. shelf list, overdue list) and catalogue cards.

The ELM (Electronic Library Management) library system was developed by Brett Lester in Perth, Western Australia between 1987 and 1991 (Clyde, 1993: 60). ELM is a fully integrated system which operates in an Advanced PICK native operating environment allowing for an unlimited number of users on multi-task terminals in the school library situation; it is suitable for use on minicomputers and mainframes in addition to PC's. All 19 ELM school library sites are located in Western Australia. The system accepts SCIS records and is now marketed by Collier Knyn & Associates of South Perth.

Originally developed in North America and marketed there by Nichols Advanced Technologies Inc., the MOLLI (Micro Online Library Information) system is marketed in Australia by RAECO Technologies. Recently rated the number one system for school libraries by the American Library Association's *Library Technology Reports* (1993: 363-378), MOLLI is currently installed in 16 school libraries Australia-wide. Whilst MOLLI operates in an MS-DOS environment, Nichols have recently announced the release of Athena (for Windows) and Athena/Mac (for the Macintosh). These new products incorporate graphical user interface and touch screen technologies into the integrated library management system.

In 1993, Ferntree Computer Corporation became involved with Libraries 2000 which it markets as its 'lower to mid range UNIX based library management sytem'. Prior to that time, the system was marketed under the name INFOMARC and later re-named Libraries 2000 by the developers (Libraries 2000).There are currently 14 school library users of the system, most of them in Western Australia where all sites are supported by Unix Systems Specialists of West Perth.

Developed in Victoria and introduced onto the market in 1990, the ROS Library System is a fully integrated system which features multi-user CD access and a remote stocktake facility. The system is ASCISRECON compatible and can operate as a single-task terminal or on multi-task terminals on a LAN using Novell Netware. There are 14 ROS Library Systems installed in school libraries, all of which are in Victoria.

The most notable development with the minicomputer-based URICA 2000 Library System in 1993 was the appearance of version 5.0 of the software. URICA 2000 is installed in a wide range of library types worldwide. Chris Thewlis of General Automation, Australian marketers of URICA 2000, points out that the system is '...generally only sold to private schools due to it being a minicomputer system. This makes it too expensive for government schools.' There are currently 13 school library users of the system Australia-wide.

The Integrated Library Management System (formerly the Lothlorien Library Management System) was first developed by Lothlorien Software in 1981. The system was quite a popular choice among teacher-librarians in the mid-1980s but is now installed in just six school libraries, all but one of which are in NSW. Tillie Eakin of Lothlorien Software was critical of '...some of the mandatory requirements laid down in the NSW tender document' for the development and supply of school library automation software for government schools and says that the company now targets corporate and special libraries as its market for the system.

BOOK Plus from Stowe Computing Australia is installed in three joint-use libraries, all of which include a secondary school or senior college library. Formerly called BOOK, the software underwent major re-development and BOOK Plus was released onto the market in 1986. Currently available as Release 27, the system has had particular appeal to school libraries in multi-library environments.

Geographical distribution of automated systems

Table 10 shows that the 'most automated' state/territory in Australia is the Australian Capital Territory where 81.3 per cent of school libraries are automated. The percentage of school libraries with automated systems is set to rise sharply in 1994-95. In Tasmania, for example, the installation of OASIS Library into the state's primary school libraries had only just begun toward the end of 1993 as had the 'conversion' of many secondary school libraries from Starlite on TASNET to Dynix on TALIS. As previously noted, the NSW Department of School Education has received funding to install OASIS Library into 996 small schools (schools with an enrolment of less than 300 students) in 1994-95.

Table 10: Number/percentage of automated school libraries in each state/territory of Australia as at 31 December 1993

State/Territory	Total Number of Schools*	Number of Automated School Libraries	% of Automated School Libraries
ACT	134	109	81.3
SA	861	567	65.9
NSW	3035	1502	49.5
NT	172	76**	44.2
VIC	2617	1080	41.3
WA	1015	334	33.0
QLD	1729	567	32.8
TAS	302	73***	24.2
	9865	4308	

* Source: *Schools Australia 1993*, p.4.

** Includes 21 schools on DOBIS/LIBIS

*** Includes 32 schools which were using Starlite on TASNET and were 'converted' to Dynix on TALIS in late December 1993.

Australian systems overseas

Five vendors of Australian designed systems reported installations in school libraries overseas. AIMS, Book Mark, Book Plus and Metamarc all reported a small number of overseas installations, while Softlink Australia reported a total of 224 OASIS Library school sites overseas made up of 127 European sites (where OASIS Library is marketed as Alice), 83 sites in New Zealand, at least six sites in Iceland (where OASIS Library is known as EMBLA), two sites each in Indonesia, Korea and Papua New Guinea and one site each in both Singapore and Thailand.

Foreign language/multilingual capabilities

Seven vendors reported that their systems had a foreign language or multilingual capability, while one vendor (Microfusion) reported development in this area. Generally, multilingual capability allows users to change the language of the screen display on the terminal they are using. Users may also be able to define their own languages if the language uses Roman notation. Ray Walsh from Softlink Australia reported that some users of OASIS Library, for example, have defined various Aboriginal dialects, while others have redefined the screen prompts to suit their individual work environments. See Table 11 for systems which have these capabilities and the languages they have available.

Table 11: Foreign language/multilingual capabilities

System Name	Languages Available
Biblios	Any foreign character set including Roman alphabet languages and languages based on Kanji characters, e.g. Chinese and Japanese
Book Plus	French and German
Dynix*	Available in 20+ languages, more in development
OASIS Library	Arabic, Bahasa Malaysia, French, Gaelic, Icelandic, Spanish and Welsh, more in development
Ocelot for Schools	French
URICA	Any Roman alphabet language plus Chinese and Japanese
Winnebago	Spanish

* Available in fully-featured version only

Recent developments...and the future

It is to be hoped that this first survey of school library automation in Australia has achieved its aim in providing interested readers with some basic descriptive data about the market share and geographic distribution of automated systems in school libraries. Subsequent surveys will allow for some analysis of trends in the data over time and will also examine some matters of interest to both vendors and practitioners alike. Emerging issues include union catalogues, integrated school networks (LANs), the changeover from AUSMARC to USMARC and the planned introduction of CE (Curriculum Enhanced) MARC.

Note to vendors: If you have a system you think should be included in the next annual survey of school library systems, contact Ken Dillon, School of Information Studies, Charles Sturt University-Riverina, Locked Bag 675, Wagga Wagga NSW 2678. Ph. (069) 332545, Fax. (069) 332733; E-mail: kdillon@csu.edu.au

Contact information for automated systems

AIMS
Concord Data Solutions Pty Ltd
301 Coronation Drive
Milton QLD 4064
(07) 368 1966

Biblios
QANTEL Australia Pty Ltd
PO Box 68
St Leonards NSW 2065
(02) 438 1588

Book Mark
Materials Development and Technology Services Unit
Locked Bag 12
Woodville SA 5011
(08) 243 5559

BOOK Plus
Stowe Computing Australia Pty Ltd
208 Greenhill Road
Eastwood SA 5063
(08) 372 6111

Book Worm
Orana Home and Business Centre Pty Ltd
52 Church Street
Dubbo NSW 2830
(068) 84 4200

Books
Sandhurst Computer Services Pty Ltd
24 Curtin Street
Bendigo VIC 3550
(054) 43 3561

CSL Library
Level 3
231 Miller Street
North Sydney NSW 2060
(02) 954 9119

DATA TREK School Series
Data Trek (Australasia) Pty Ltd
15/3 Lancaster Street
Ingleburn NSW 2565
(02) 829 2644

DOBIS/LIBIS
IBM Australia Ltd
Coonara Avenue
West Pennant Hills NSW 2125
(02) 634 9111

Dynix Schools
Dynix Australia Pty Ltd
175 Fullarton Road
Dulwich SA 5065
(08) 366 4000

HLM
Collier Knyn and Associates
76 Mill Point Road
South Perth WA 6151
(09) 474 3188

Imagine
GUI Imagine
PO Box 69
Sassafras VIC 3787
(03) 755 2832

Inmagic Plus
Triad Data Magic Pty Ltd
79-81 Palmerston Crescent
South Melbourne VIC 3205
(03) 696 4866

Integrated Library Management System
Lothlorien Software
PO Box 339
Randwick NSW 2031
(02) 398 4122

Libraries 2000
Ferntree Computer Corporation
PO Box 42
Clayton VIC 3168
(03) 541 5600

Machee Library System
Triple R Software Services
22 Calrossie Avenue
Montmorency VIC 3094
(03) 434 2704

Mac'n Library
Tailor Made Database Co.
PO Box 277
Fawkner VIC 3060
(03) 359 3843

Metamarc
Microskil Pty Ltd
173 Burke Road
Glen Iris VIC 3146
(03) 576 0066

Microfusion
The Education Company Australia Pty Ltd
PO Box 603
Victoria Park WA 6100
(09) 472 1477

MOLLI
Raeco Technology
Locked Bag 243 MDA
Knoxfield VIC 3180
(03) 764 2777

MUSAC Library
Nutshell Technologies
PO Box 1676
Bathurst NSW 2795
(063) 68 1035

OASIS
Softlink Australia
Softlink House
68 Commerical Drive
Shailer Park QLD 4128
(07) 801 4111

Ocelot for Schools
Ferntree Computer Corporation
PO Box 42
Clayton VIC 3168
(03) 541 5600

PC School Library
Com-Assist Solutions Pty Ltd
32 William Street
Rockhampton QLD 4700
(079) 222 237

Prolib
Correlations
PO Box 100
Longford TAS 7301
(003) 91 2212

ROS Library System
ROS Software Pty Ltd
6 Ambrose Street
Emerald VIC 3782
(059) 68 3891

SIRCAT II
MircoPower Pty Ltd
PO Box 170
Ivanhoe VIC 3079
(03) 497 3855

URICA 2000
General Automation Pty Ltd
GA House
132 Arthur Street
North Sydney NSW 2060
(02) 959 1234

Winnebago
Educational Media Supplies
708 London Road
Chandler QLD 4155
(07) 390 1240

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Crucial Factors in Online Enquiry: OPAC Design for School Library Users

Paul Drayton

Introduction

The availability of online public access catalogues (OPACs) has been one of the most significant benefits to flow to school library users from the wave of library automation which has moved through Australian and overseas schools in the late 1980s and early 1990s.

Teacher-librarians have needed to devote considerable time to managing the implementation of automated systems and continue to do so in order to maximise the effectiveness of the system in their individual school situations. OPACs, however, provide access to the school library's bibliographic services for users and impact on development of information retrieval skills by students. These factors present additional continuing challenges for both system developers and teacher-librarians.

One challenge is to design interfaces which appropriately reflect user (particularly student) behaviours and strategies in information retrieval. 'It is important to evaluate exactly how systems are actually used to determine if they are properly crafted for an audience of children and young adults' (Jacobson, 1991: 109).

Similarly, teacher-librarians would benefit from the results of these evaluations as they face the challenges of structuring, in a relevant way, the information to be retrieved from the OPAC and designing 'effective and efficient instruction for searching in electronic sources' (Chen, 1993: 33).

Writing about the implementation of automated systems in their school libraries, teacher-librarians report an enthusiastic interest in OPACs amongst users (Jenkins, 1989; Winkless, 1989; Channells, 1989; Harris and Lee, 1989). An increasing number of schools are also using their OPAC terminals to allow users to access wider services such as encyclopedias on CD-ROM and connection to remote databases.

It is my intention in this paper, firstly, to discuss some crucial factors, identified from the research literature, in the interaction between children and OPACs and their relevance for interface development and instruction; further, to discuss issues in the development of one particular OPAC, namely OASIS Library Enquiry; and, finally, to consider implications for the future.

What is an OPAC?

OPAC stands for online public access catalogue and can be described as follows:

> An *online catalogue* provides access using the computer terminal to the complete bibliographic record of all the library's holdings...in which the user is connected directly to the information source (the catalogue) and in which responses occur quickly enough to enable the search request to be modified dynamically as the session progresses (Owens cited in Drayton, 1989: 9).

With the rapid development and wider implementation of OPACs in school libraries, and as the range of services accessible at OPAC workstations is becoming more than just one catalogue, a more comprehensive description emerges:

> The online catalog provides instant access to catalog records as well as inventory data and brief acquisitions records via powerful interactive searching and help capabilities. It allows browsing as well as keyword searches on author, title, subject and other fields such as notes and copyright. Boolean logic can be used for complex searches. Searching is assisted by help menus, prompts, mouse pointing devices, and visual or audio tutors. The online catalog may contain other types of databases such as journal indexes, and it may allow remote access from classroom, office or home (Schamber, 1990).

What does research indicate about the way primary and secondary students use OPACs and what implications are there for OPAC design and information skills instruction?

Frances Jacobson (1991: 109) reviewed library literature dealing with interactive information retrieval systems and their actual *effectiveness* with youth, emphasising particularly those researchers 'who have paid special attention to the typical search patterns and strategies of young people and to the cognitive processes that must be understood in order to design age appropriate system interfaces'.

Although their study examined sixth graders' use of a card catalogue rather than an online system , Moore and St George cited in Jacobson (1991: 109-110) identify some significant points about the way the children selected and applied keywords. The students generated a list of questions about an assigned topic and from this produced keywords. Moore and St George reported that 'their subjects had difficulty generating alternative terms', 'demonstrated heavy reliance on title and cover information' and had 'difficulty in matching their natural information keywords to the search terms of the catalogue, in matching keywords to the organisational access points within the information source itself i.e. table of contents or the index of a book.'

Hooten cited in Jacobson (1991) differentiates between skills required to search card catalogues and online catalogues. Skills emphasised in using a card catalogue include following an alphabetical sequence, knowing certain general filing rules and being able to engage in a series of ordered steps; whereas online systems utilising keyword access require correct spelling, spacing, punctuation and the ability to specify categories of search, e.g. author, title or subject.

Jacobson identifies three suggestions that Hooten makes as a result of her research. Systems should allow flexibility to individual libraries in screen and record design, include spell-checkers and have the ability to ignore initial articles when searching.

Edmonds and her colleagues cited in Wright (1993: 10) found that fourth to sixth graders had major difficulties in identifying the call number they needed to use in locating an item on the shelf whether using a card catalogue or a CLSI touch terminal online catalogue. In fact, although students had difficulties with both systems, they achieved more 'success' with the card catalogue than the online system. The researchers argue for simpler catalogues and that children be taught specific tactics to increase their search effectiveness.

Jacobson (1991) and Wright (1993) both include discussion of research by Borgman (1991) and her research associates on a system that makes the move from an online interface which mimics a card catalogue to a subject oriented browsing approach which seeks to utilise natural searching behaviours and language. Wright (1993: 10-11) describes the information retrieval component of Project SEED (Science for Early Educational Development) as

> ...a browsing information retrieval system in elementary science that uses a bookshelf graphic model as a guide for moving from general to more specific information. Children use a mouse device to click on the topic of their choice that expands the bookshelf to full-screen size and displays specific subject headings and subtopics of those headings. Clicking on a heading or subheading leads to a display of specific titles. Moving backward and forward in the system is done by clicking on the appropriate graphic.

Jacobson (1991: 111) reports that Borgman found in initial research on the browsing option of the interface that 34 children from fourth, fifth and sixth grades were able to locate items for 77.5 per cent of topics given to them. They were given no explicit instruction and very little practice time. A keyword interface was yet to be developed at the time of this research and further research was planned. Jacobson (1991: 111) comments:

> It appears that liberation from forced reliance upon keyboard skills and other rule based protocol, in favour of a browsing type mode of searching using more natural-language terminology, may indeed be a key to children's success with an online system.

To examine more fully some of the factors discussed thus far it may be useful to consider in a little more detail two further studies from the United States on children's information retrieval behaviour. The first, by Paul Solomon, reports on research exploring the information retrieval behaviour of first to sixth graders in an elementary school library. The second, by Shu-Hsien Chen, studies the online catalogue searching behaviour of 35 eleventh graders in a high school context.

The Solomon study

Solomon (1993) reports on research from a naturalistic study he undertook on children using an OPAC for information retrieval in an elementary school library. He was concerned to examine the total integration of all major elements that fit together when a child seeks to solve an information retrieval problem using an OPAC. Solomon describes three factors involved in using information retrieval systems, namely *uncertainty*, *variety* and *complexity*, and then gives attention to 'how a researched-based understanding of these factors in a particular situation might aide in the development of information retrieval systems that support their users' (Solomon, 1993: 246).

Uncertainty is defined as the fact that '...we cannot predict with certainty terms that indexers will assign to documents nor those that people will employ when searching for information' (Solomon, 1993: 246).

Variety relates to both the various subject descriptors assigned to documents and the variety of ways searchers think about their topics and interests: 'Thus, the gap between user-generated search terms and index generated subject descriptors is aggravated by the variety of terms that searchers use to explore the information structure of the database' (Solomon, 1993: 246).

The idea of *complexity* '...is that the information seeking process of which an information retrieval system may be a component is inherently intricate, non linear, partially hidden and variable' (Solomon, 1993: 246).

Using multiple research methods such as observing, questioning, collecting think-aloud protocols and analysing documents, Solomon collected data over the 1989-90 school year on the use of an OPAC by 679 students enrolled in grades 1-6 from an elementary school.

The OPAC interface used offered input through subject, title or author blocks on the initial screen. Retrieval was via a 'keyword match with the appropriate inverted B-tree indexes for the subject, title, and/or author field(s) where a query was entered' (Solomon, 1993: 248). Subject headings which were used in the OPAC's database were drawn from Library of Congress Subject Headings (LCSH). The interface instructed children to 'Type in what you are looking for' and gave three possible responses to a search, i.e. a TERM NOT FOUND message, a QUERY ERROR message or a list of items retrieved.

In discussing the results, Solomon reported on the patterns of success and failure in the OPAC searches, and the initiating actions, search strategies and search terms of the children. 66 per cent of the OPAC transactions observed were successful, i.e. a satisfactory list of materials was produced. Solomon identified three patterns in the successful searches which contributed to their success:

1. in 8 per cent of searches children sought assistance;

2. in 17 per cent of searches children applied OPAC control strategies to overcome an impasse;

3. in 41 per cent of the transactions children expressed their information needs with simple, concrete search terms.

Assistance from adults or their peers was both planned and reactive, was strongest in the earlier grades and used least frequently by fifth and sixth graders.

Those children who employed control strategies recognised that either there may be a problem in using the OPAC for which they had to prepare a solution in advance, e.g. find a correct spelling, or that their previous move in the search process had been unsuccessful and a follow-up move was required. Examples of their control actions included 'shifting the focus of their search (e.g. from subject to title) and moves to broader, narrower or related terms' (Solomon, 1993: 150). Strategies were used least by the earlier grades and increased with grade.

The use of simple concrete search terms such as *cats, dogs, dinosaurs, etc.* accounted for the highest number of successful OPAC searches. Solomon explains that such concrete terms map directly to subjects used in the OPAC's database. The use of this approach was fairly consistent across the grades. Sixth graders employed this approach less than Grade 5 students because their information needs were often not able to be met by common terms. Grade 1 students had a lower rate of use because they relied more on their pattern of assistance.

In examining the occurrence of unsuccessful transactions, Solomon uses the term 'breakdown' rather than 'failure'. He defines 'breakdown' in this context as '...an interruption in the flow of normal activity that can either be overcome with some effort or serve as a lasting blockage to progress. Failure implied deficiency, inadequacy or stoppage' (Solomon, 1993: 250). Solomon argues that children's OPAC breakdowns did not always

lead to failure, in fact many times they used a breakdown to redirect their search or replace their strategy with a more successful one. Breakdowns therefore yielded useful information about OPAC transactions both to the user and as a signal to information retrieval designers that new designs may be needed.

Three factors were identified in breakdowns that led to failure. These were idiosyncrasies of the software, characteristics of the subject headings used and deficiencies in the skills of the users. In order to determine why success occurred on some occasions and failure on others, Solomon applied a variety of analyses to his data, including tracking a first grade group from their introduction to the OPAC through one year of their use of the system. From these analyses he developed a framework in which to evaluate breakdowns and their implications for OPAC design:

> First, children and other users do not approach the OPAC for the first time with blank slates. Rather, they possess a variety of knowledge, rules of action and skilled behaviour that has either positive, negative, or neutral impact on their information retrieval success. This knowledge base along with any insights gained from orienting activities, provides children with expectations about the tasks that the OPAC supports, required operational actions and functional capabilities (Solomon, 1993: 250-251).

From his research Solomon argues that children over their time of use of the OPAC showed a progression of movement from knowledge-based to rule-based and then to skill-based control actions. He used this movement as a framework with which to view the kinds of breakdowns which lead to failure. These are summarised in Table 1. Solomon also analysed children's initiating actions, search strategies and search terms.

Implications

Change in competence of children

Solomon argues that we must recognise that OPAC users change with experience and this has two major impacts.

> User support
>
> User support requirements shift: 'For example, beginning users often need assistance to know the appropriate next step (e.g. press the ENTER key) whereas more advanced users need assistance in recovering from an error e.g. using an alternative search strategy (say, move from subject to title or check spelling) or taking the user from their search term to the term used by the OPAC' (Solomon, 1993: 262).
>
> Demands on the information retrieval system
>
> 'Demands on the information retrieval system change as users become more knowledgeable and intellectually sophisticated in their understanding of a topic area' (Solomon, 1993: 262).

Table 1: Classification of OPAC breakdown

	User Requirements	Occurrence	Design Implications
Knowledge			
Conditional	Monitor OPAC response, take action if appropriate	Low in first grade and increases; most prevalent following spelling	Point out ambiguous queries (e.g. 'bat: animal or object', 'whale or Wales?')
Processing	Follow up action is users responsibility	Low in lower grades to high in upper grades	Offer strategy options
Content	Content knowledge in area of interest or need	Uniform for all grades, character varies with grade	Access tools tailored to curriculum and interests
Rules			
Syntax	Know form requirements: no extra spaces or punctuation	All grades. Conflict with emphasis on punctuation	Ignore extra spaces and punctuation in query parsing
Query form	Know requirements for well formed queries (e.g. nouns, plural form)	All grades with greater frequency in upper grades	Display word forms in use; ignore terms not in use
Focus	Evaluate focus of query: author, subject, title	All grades	Follow failed query with test on other foci
Skills			
OPAC	Understanding of OPAC uses and products	Primarily first grade with lesser prevalence in second, third and fifth	Learning aids, context sensitive help, OPAC response to action/inaction
Reading	Able to read words associated with interests	First grade for titles; all grades for some words in summaries	Users initiated voice synthesis feature
Spelling/keying	Able to locate keys, spell, and review term entry	All grades; most prevalent breakdown	Spelling checker, new interface options (e.g., point and shoot)

Source: Solomon, 1993: 252

Subject access and interface design

To put the following implications in context, Solomon notes that 'despite the barriers of the Library of Congress Subject Headings and an OPAC that did not take child users into account even the smallest first graders achieved some success although all children experienced some moments of frustration, confusion and failure' (Solomon, 1993: 263).

He then returns to his findings concerning the progression child users move through in their use of OPACs. When they first encounter an OPAC, students are starting with an inadequate understanding of the variety of index terms they have to overcome and how those terms are allocated to items in the catalogue. So these characteristics are missing from the knowledge, rules and skills they bring to the OPAC and this limits their control of it. As they are taught how to use it, as they explore and work out strategies to get around problems, they get to a point where they 'know enough to find the materials they want most of the time'.

Therefore, Solomon argues we need a retrieval system which 'supports this learning process, helps users recover from breakdowns, and offers alternatives' thereby 'enhancing information retrieval while encouraging exploration and understanding'.

It is possible, he states, from the analysis of search terms used by children, to predict subject requests likely to be encountered by an OPAC. He therefore nominates basic features which should be present in an OPAC.

Table 2: Basic features of OPAC design

Features	Examples
Specific user tools to deal with anticipated requests	Displays of subject headings and their interrelationships
General user mechanisms for new and unexpected requests	Displays and navigation tools for exploring subject headings in use
Management tools to enable sites to deal with emerging interests and curricular demands	Interactive programs for creating displays, adding cross references and analysing subject headings for a domain of interest

Source: Solomon, 1993

The benefits of features like these would be to provide the ability to tailor a system to the requirements of a given situation which would provide more control to the user in what to explore, extend the relevance of the system into the future and enhance its situationality.

Finally, Solomon argues for the need to create alternative interfaces and test their ability to support the design features suggested.

The Chen study

When high school students conduct online catalogue searches, do they have a higher success rate with an author, a title, or a subject search? What errors do students make while conducting an online catalogue search? What types of errors do students most frequently make in conducting an online catalogue search? How do students reformulate a search when experiencing problems or difficulties in the online catalogue search?

These are questions that Shu-Hsien Chen (1993: 33) sought to answer in her study of the search behaviours of eleventh graders using an online catalogue and thereby to '...pinpoint both general and specific problems the school library media specialist should address in information-skills instruction'.

Thirty-five Grade 11 students of average to slightly less than average ability from a Georgia high school were randomly selected from an English course designed for students who are proceeding to college. The research methods emphasised observation of student behaviour and analysis of search results.

The students had no formal experience with the online system before the study. The researcher took pairs of students for two 50-minute sessions, the first for instruction in the OPAC, the second to complete the actual searches. In conducting the search, students were required to solve eight search problems and record the results, a possible maximum of 27 correct results. To be correct, answers had to be selected correctly from the screen display and transcribed correctly on the search problem sheet.

Thus the success rate was measured as:

$$\text{Success rate} = \frac{\text{Number of correct items}}{27} \times 100\%$$

Limitations

Chen (1993: 35) identifies the following factors which limit the degree to which her proceeding results can be generalised to other settings. They are:

1. testing was carried out in only one site;
2. the duration of the study was short and instruction in the system was provided by the researcher;
3. the OPAC system was new to students, was not used widely within schools and it had a variety of technical flaws.

Results

Success rate scores ranged between 27 and 5 with the mean 16.9. Author, title and subject searches all had success rates of 60 per cent or above; however, author searches had the highest success rate (although the differences between the three were not statistically different), and generally the success rates for author and title searches were higher than those for subject searches.

Errors students made in searching could be summarised as follows:

1. typographical and spelling errors
2. errors in using the system
3. errors in generating search terms
4. errors in using information
5. errors in recording search results

After analysing the errors made, Chen further divided the errors into two main groups:

1. impact errors, i.e. errors in the final answers on the sheets;
2. potential errors, i.e. errors students made during the search process that they detected and corrected before recording the final answers.

In generating search terms, Chen found that, similar to Moore and St George, there was a conflict between the student's natural language expressions and the controlled vocabulary of the system.

More students made errors in using substantive information than in any other area. This included errors related to the search problems, to search information displayed on the screen and to extracting screen information. Chen (1993: 36) provides a clear example related to extracting screen information from a classification number search:

> Here, thirty-four of thirty-five students in the study were able to obtain a screen that included the correct answer (one of four items listed). Fifty percent of these students, however, failed to select the item that satisfied all the problem elements specified by the search question.

Analysis of videotaped observation data also revealed reformulation patterns that emerged from the students' attempts to improve their search results. Chen describes two techniques mostly applied by the students, namely, switching search types (e.g. from author to title)

and rephrasing search terms. For the latter this might be correcting spelling and spacing for an author or title search, whereas in a subject search this might involve techniques such as changing terms from specific to general.

While they handed straightforward searches reasonably well, the problems which were exhibited by the students suggest, according to Chen, 'the old problem of not understanding the basic catalogue structure may still remain.' While allowances should be made for what appears to have been a complicated online system, many of the students lacked understanding of the Dewey classification system and 'skills in analysing search problems and in reviewing search results' (Chen, 1993: 37).

As with Solomon's study, most students were able to achieve some success even allowing for the limitations of the OPAC that was used and their lack of experience with it. No doubt it is reasonable to expect that they will search more easily and quickly as their experience with the system grows.

The significance of Chen's research is that it urges us to consider the skills an individual needs to bring to the online search process regardless of the sophistication of the technology and in addition to the mechanics of operating a particular system:

> The efficacy of the search depends on the individual's ability to match key words to information sources, to see relationships between differing aspects of the topic...to monitor the outcome of search strategies and to regulate them accordingly (Moore and St George cited in Chen, 1993: 38).

Chen urges research on a variety of systems used by different age groups to identify problems particular to the use of this new technology. Findings from such research can assist practitioners in developing effective instructional programs for teaching students online searching skills. Even from this one study, however, the need for some essential basic skills can be confirmed:

> No matter how advanced technology facilitates information seeking in the future, students will still need a familiar assortment of skills to perform successful searches: typing, spelling, usage, reading, interpreting, knowing key word concepts, and understanding the fundamentals of a school's classification system (Chen, 1993: 38).

Design considerations in one OPAC interface: a discussion of OASIS Library enquiry

OASIS Library is an integrated library automation system developed by the NSW Department of School Education and Softlink Australia Pty Ltd. The library modules were one part of a total school administration system the specifications of which were put to tender by the Department in 1987. The successful tenderer was Softlink Australia Pty Ltd which at the time marketed a library automation system called ALARM. In consultation with officers from the Department's Management Information Services Directorate (MISD), as it was then known, Softlink programmed the design with testing and trialling taking place in 1988.

Since 1989 OASIS Library has been installed in over 1100 NSW government schools. 1994 has seen the upgrading of all existing government school users of OASIS Library to a new version of the program. The number of schools installed will grow to over 2200 by the end of 1995 with the further installation in all schools with a pupil enrolment below 300. Softlink, as part of its agreement with the Department, has marketed OASIS Library

throughout Australia and overseas, resulting in a large number of additional sites. They have also further developed the capabilities of the system with a number of 'add on' modules.

OASIS Library has received wide acceptance amongst users, and a significant part of that user acceptance has centred on the online enquiry module. Following is a discussion of some of the design objectives which the Department sought in the OPAC interface and the solutions designed by Softlink and departmental officers to meet them.

An underlying objective for the operation of OASIS enquiry was that the interface be helpful and friendly. This was particularly important as the target users of the system would range in age from infants students through to adults. The search capability needed to facilitate basic searches through to multiple search term transactions utilising Boolean connectors.

The OPAC entry screen (see Figure 1) is first evidence of this approach, simple in layout, uncluttered with instructions or text but encouraging the user to enter a search term.[1] The flashing character aims to catch the attention of younger users while providing an uncomplicated and non-threatening entry point. Solomon's (1993: 250) finding in his study of elementary grade children's OPAC use that 'children's information needs were frequently expressed in simple, concrete terms such as *cats, dogs, baseball, karate,* and *dinosaurs*' would appear to be evidence in support of such a design approach.

Figure 1: OASIS OPAC entry screen

Two further priorities for the OPAC design were that enquirers should be able to use truncated search terms and that the program in responding to the entry of a search term be able to display the alphabetical range of headings surrounding the search term. This is both to assist the spelling limitations of users and to make enquirers aware of possible alternative terms close alphabetically to the one they have chosen.

[1] In the latest version of the software the teacher-librarian can use the entry screen to provide text messages to users. They therefore have the choice to determine how much additional information appears on that screen and for what purpose.

<F1> Help <F10> Exit
ENQUIRY
Palm Tree Cent.
Enter Search Word(s)
croc
Check out our display of new resources before you leave the Library today!
Registered User : School Administration Project

Figure 2: Entering a truncated search term

In response OASIS presents the user with a range of possible matches, highlighting with a flashing pointer the closest match to the term entered (see Figure 3).

In OASIS Library enquirers need only enter all or part of a word or number related to their search for their enquiry to begin, e.g. entering a truncated form of the word *crocodile* (see Figure 2).

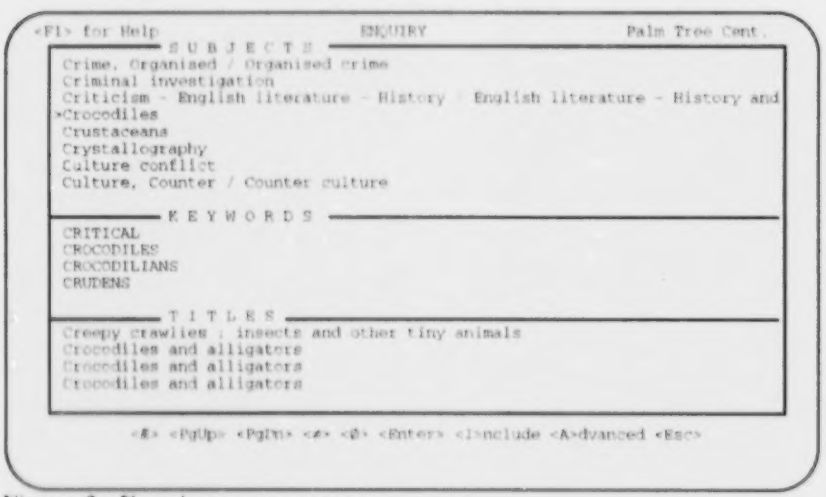

Figure 3: Enquiry access screen

The user would then be viewing one of the three screen pages on what could be termed the Access screen of OASIS Enquiry. In this case a match is highlighted in the subjects file. The user is able to scan on the same screen possible matches in both the keywords[2] and titles file. The other two pages of this screen display respectively Author, Series, Classification and Barcode, Accession Number. The screen page which will be displayed first is determined by where OASIS Library locates a match in the files searched. If a match

[2] Keywords can be generated automatically for all words in a title except stop words and created manually for words in title and words in the notes field for each record.

is found in the subject file, this screen page will always be presented first, regardless of whether matches are found in any other files.

If the items about *crocodiles* are what they are seeking, then just pressing the <ENTER> key will provide the user with a list of resources and their shelf locations[3] (see Figure 4).

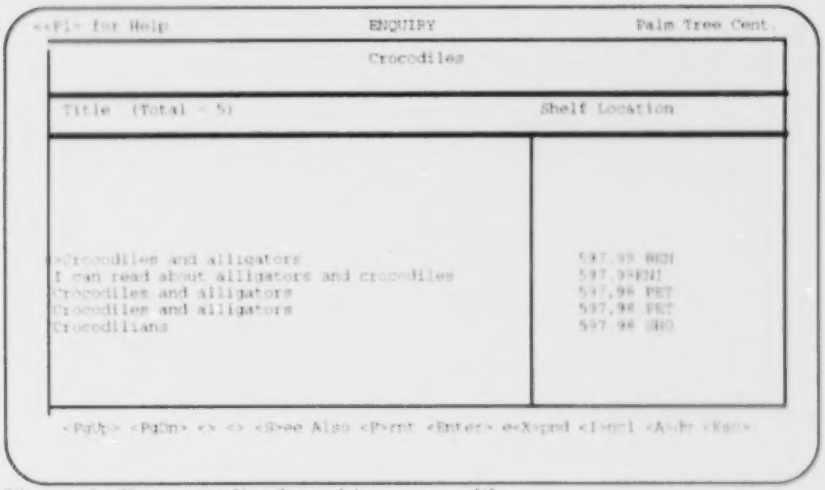

Figure 4: Resource list for subject *crocodiles*

For many simple searches the enquirer need go no further than this screen to achieve the necessary result. The enquirer may select a print option to print a resource list (resources in shelf order) with which to search the shelves, write down brief information with which to search, or if more information on a particular title is required, move the pointer next to the required title and press <ENTER> once more to reveal more detailed information, including the loan status for copies of the title (see Figure 5).

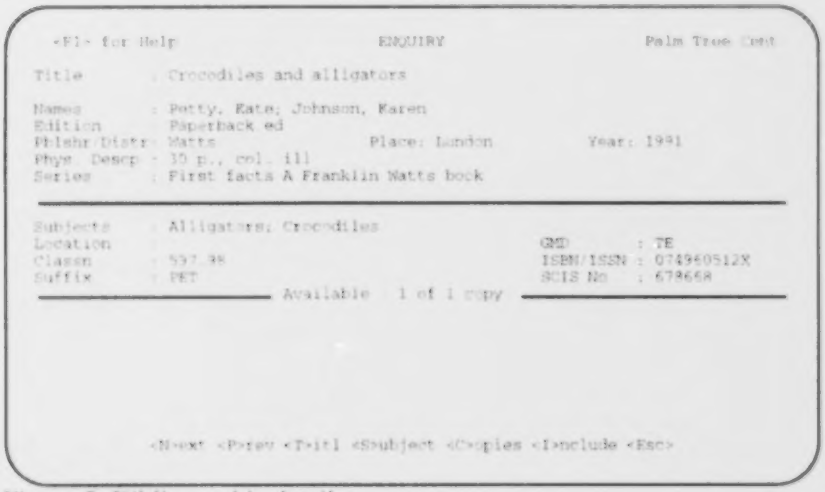

Figure 5: Bibliographic details

[3] GMD description is shown next to titles on the Access and Resource List Screens when titles are other than GMD Text.

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It was important to keep even the most detailed screen simple in layout yet flexible. The main information concerning a resource is prominently positioned; however, the user can open windows to reveal more details about the item such as details of individual copies, notes where these exceed a few lines on screen, or list of subjects where these are too many to view on the standard screen, by selecting the appropriate letter from the option bar at the bottom of the screen.

A further objective was that a user could easily backtrack through screens. This is achieved by using the <ESC> key to move back one screen at a time or by using a function key to go immediately to the entry screen. When required, users can access context specific Help screens for any screen of OASIS Enquiry.

In addition to providing for simple direct searching it was important that users be able to undertake browsing in their searches and be able to construct more complex searches using Boolean connectors OR, AND, and AND NOT. For instance, an enquirer wishing to construct a Boolean[4] search on Dolphins and Whales can enter the search term *Dolphins* and then, when OASIS highlights the match, select <I>nclude to include this term in an Advanced Search (see Figure 6).

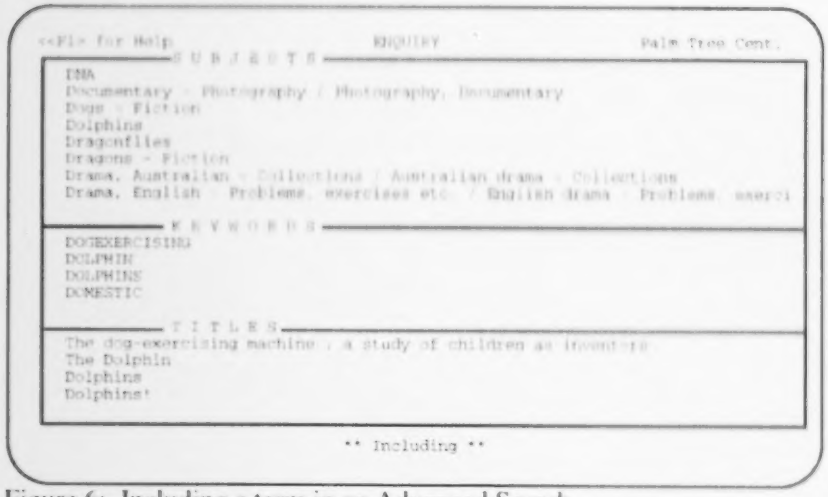

Figure 6: Including a term in an Advanced Search

Selecting the right-hand arrow from the option bar expands the Subjects window to allow for browsing and further searching (see Figure 7).

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[4]OASIS terms this an Advanced Search

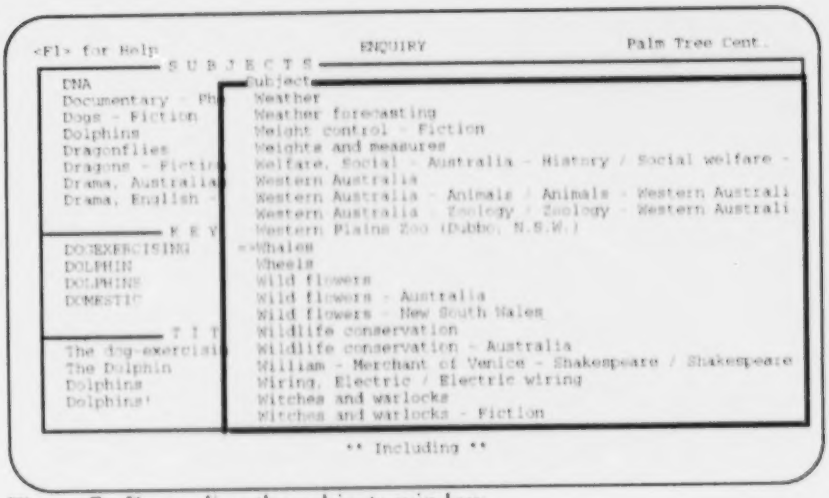

Figure 7: Expanding the subjects window

Users can move up and down the list using the cursor keys or by operating a <F>ind option within the window. Once located, the term can be included in the Advanced search. Each section of the three pages of the Access screen can be expanded in this way, and users can progress to other screens in the same way as normal from the Access screen.

Once all terms have been included, selecting <A>dvanced from the option bar accesses the Advanced Search screen (see Figure 8).

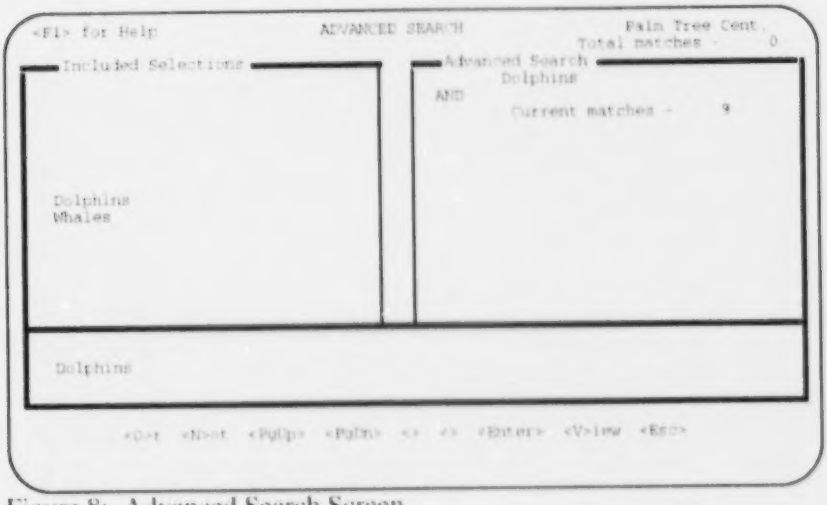

Figure 8: Advanced Search Screen

Search terms to be combined are shown on the left-hand side of the screen. By using the cursor keys and the options at the bottom of the screen, the user can combine the terms in any sequence. As terms are moved to the active side of the screen in combination with any of the three Boolean connectors, OASIS Library initiates the appropriate searches and reports dynamically to the user on the number of successful matches. Also available on this screen, but not shown in Figure 8, are options to refine the Advance Searches by GMD and by Publication Date. For instance, in this example, if the search were to be limited also by Publication Date, the screen would appear as in Figure 9.

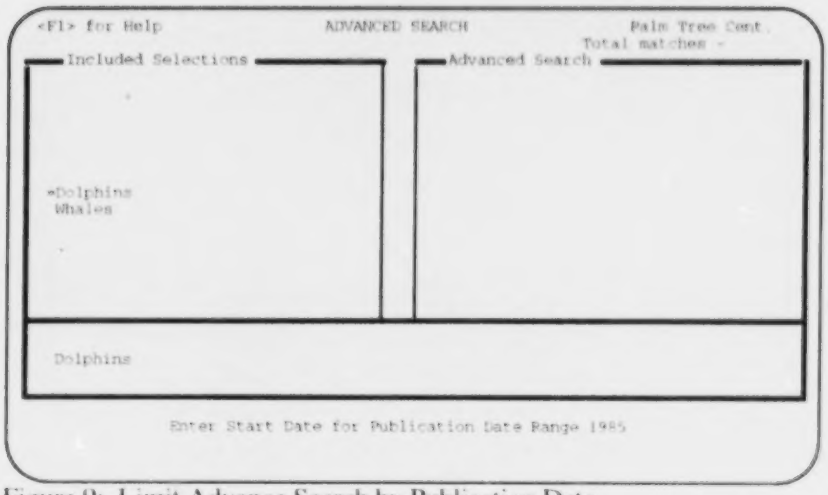

Figure 9: Limit Advance Search by Publication Date

The user enters the desired date range and the limitation applies to the preceding search.

OASIS Library was designed also to provide the teacher-librarian with some ability to customise the way the OPAC operates for students or the way information can be organised for retrieval via the setting of certain parameters in the Management module. Parameters control factors such as whether users can initiate print requests form OPAC terminals, the automatic creation of subject SEE References and methods for minimising nil results for searchers.

Given the consistent findings in research of the difficulties students have in mismatches between their natural search language and standardised descriptors used by OPACs, it is worth considering the way this issue has been approached in OASIS Library.

Information can be entered into the catalogue of OASIS Library either manually or via machine-readable records such as SCIS records. It is possible for the teacher-librarian to construct SEE References from non-preferred terms likely to be used by enquirers to preferred SCIS headings. OASIS can also be set automatically to generate SEE References by permuting each word in subject subdivisions. Figure 10 shows examples of both types of SEE References produced by the system.

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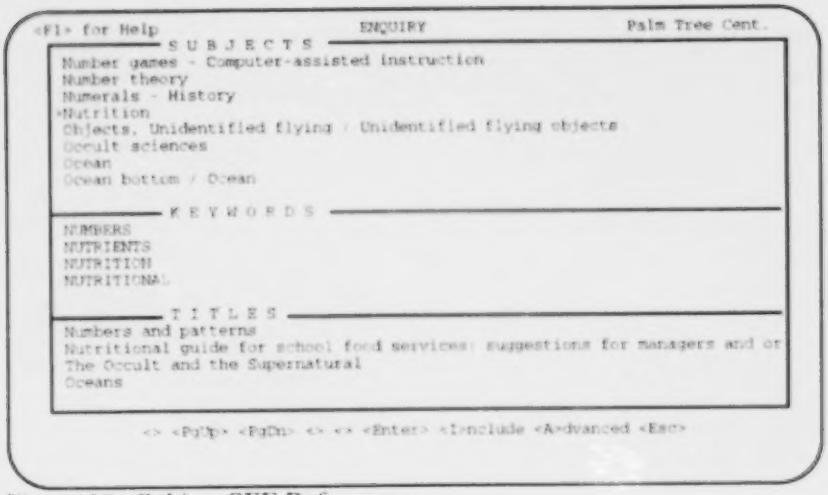

Figure 10: Subject SEE References

Ocean bottom / Ocean represents a SEE Reference created in the Subject Authority file. Selecting this term displays the list of resources for the preferred term *Ocean*, guiding the user to the best match for the term which they have used. This is, of course, dependent on the teacher-librarian entering SEE References relevant to user terminology.

Objects Unidentified Flying / Unidentified Flying Objects is an example of a system generated SEE Reference created by making each word of the subject a search descriptor. Again when any of the permutations are used by the enquirer, OASIS Library takes the user to the list of resources for the relevant preferred term.

Similarly OASIS Library online enquiry displays to the users any SEE ALSO cross references created in the Subject Authority File (see Figure 11).

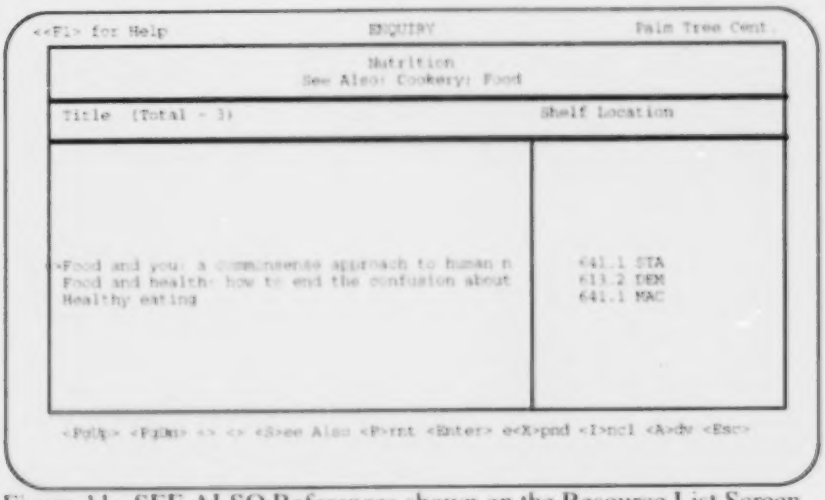

Figure 11: SEE ALSO References shown on the Resource List Screen

Given the limited management time available to many teacher-librarians, the soon to be initiated service by SCIS, where schools can purchase Subject Reference structure information in machine-readable form for downloading into systems such as OASIS Library, should be greatly welcomed by teacher-librarians. This should see an acceleration in the input of such data, thereby greatly enhancing the effectiveness of the cross referencing features of systems such as OASIS Library.

Additional modules developed by Softlink Australia for OASIS Library which integrate with the OPAC include Guidelines and Journal Indexing. These modules allow the searching of periodical indexes to be integrated into existing search features of OASIS Online Library Enquiry. The Multi-lingual module allows enquirers to change the language of the screen display on the enquiry terminal they are using. Searches can be conducted for items in the language in which they were catalogued.

Remote access to OPACs is already a reality but will become an increasing demand by students and staff. The trend to expand the services accessible at each OPAC terminal through access to CD-ROM and remote databases is likely to increase. One of the challenges for system providers will be to make the movement by the user between the various services offered at the OPAC as seamless as possible.

For OASIS Library Online Enquiry the next major development will undoubtedly be a move to a Graphical User Interface. However, as positive as the feedback is from user groups concerning the OASIS Library Online Enquiry, there remains an important need to undertake research in the Australian school context on the effectiveness of OPAC use of OASIS Library and other major systems used currently in Australian schools as a basis for such further development.

Implications for the future

The major emphasis of research into the effectiveness of OPACs in schools is on the cognitive processes that are undertaken by students in conducting a search:

> Much of the research that accepts a cognitive orientation is aimed at discovering more about information behaviour. There is a growing consensus in research of this kind that the key to the future of information systems, searching processes, and the provision of access does not lie with increasing sophistication of technology, but rather with an increased understanding of human involvement with information (Bruce, 1994: 209).

It is essential that research of this type is undertaken in Australian schools enabling studies, from a cognitive viewpoint, of student interactions with OPACs, to inform system developers and teacher-librarians regarding the effectiveness of existing automated systems and information skills programs and also to guide the appropriate application of new technological advances to system design.

Teacher-librarians, through their specialist teaching qualifications, have a key contribution to make in applying this viewpoint in the development and effective use of information systems in schools:

> As teachers, [teacher-librarians] are concerned with how their students construct sense, how they interpret information and how they enhance their own perception....They accept the need to repackage or reconstruct information to suit the requirements of individual teachers on their staffs or individual students in their care (Bruce, 1994: 207).

However, teacher-librarians, argues Bruce, are facing the additional challenge of meeting the demands placed upon them to manage the automation process in their school libraries – a challenge, he argues, in which they are unevenly supported and which is pushing them more into the role of system administrator than teacher-librarian.

Systems such as OASIS Library are providing interface designs which appear to reflect several of the research findings regarding successful search behaviours, but systematic studies are needed to test these perceptions and to support the role of teacher-librarians and teachers as they seek to facilitate student development of relevant information skills.

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MARC for Teacher-Librarians: An Introduction

Ellen Paxton

Introduction

More and more school libraries in Australia today are coming into contact with MARC records or products generated from MARC records. Many teacher-librarians, however, may not even be aware that MARC is playing a part in their library catalogue let alone know what the term means. This paper attempts to demystify MARC by providing simple and clear explanations of what a MARC record is and how it is used, its origins and history and how it has developed. The basic structure of a MARC record is also examined and illustrated by taking a sample SCIS (Schools Catalogue Information Service) catalogue card and coding it step by step into a MARC record. The paper concludes with a look at the use of MARC within SCIS, with particular emphasis on the experiences SCIS has had converting its bibliographic records from one version of MARC, AUSMARC, to another, USMARC.

MARC: what and why?

MARC stands for Machine-Readable Cataloguing. In plain English, this means a catalogue record written in a special format which allows it to be read, retrieved and manipulated by a computer. The format, known as the MARC format, is standardised. It comprises sets of codes whose meanings, rules and other specifications for use are explained in format manuals. With these manuals the cataloguer can take the information found on a standard catalogue card and code it into a MARC record which can be read by any computer programmed to accept and utilise the MARC format.

The existence of MARC means that thousands of catalogue records can be quickly and efficiently transported from one library computer, via tape, disk, even online, to another anywhere in Australia or the world. MARC makes it possible for libraries to share cataloguing information and reduces the need to catalogue materials from scratch. MARC records can be altered and manipulated by a computer to include local information to suit a particular library's needs and to produce a range of catalogue products such as cards and microfiche.

MARC records: origin and brief history

MARC originated in the mid-1960s with the Library of Congress (LC). The Library was looking for a more efficient method of sending its cataloguing information to libraries around the United States and began experimenting with machine-readable records. The idea was to produce standardised cataloguing data on magnetic tapes which could be read by computers. These tapes could then be sold and distributed to libraries, loaded into their computers and reformatted for particular purposes such as the production of catalogue cards (Tedd, 1984: 66).

After piloting the original MARC I format amongst 16 participating libraries, LC pressed ahead with the program. The MARC format was revised (MARC II), a MARC Editorial Office was created, and libraries within the US began subscribing to weekly tapes of MARC records. As they were produced by the Library of Congress, these MARC records

became known as LC MARC. In the mid-1970s cataloguing standards, such as the second edition of Anglo American Cataloguing Rules, and the general International Standard Bibliographical Description, ISBD (g), were established and gradually incorporated into the LC MARC record format (Tedd, 1984: 3). Today LC MARC has grown and developed to incorporate formats for a variety of library materials such as monographs, serials, music, projected media and has become known as USMARC (MARC records of the United States).

MARC around the world

At the same time that LC was piloting this project, the British National Bibliography (now part of the British Library) was also experimenting with machine-readable bibliographic records and collaborated with LC in developing the original MARC format (Tedd, 1984: 67). Its version of MARC is known as UK MARC. Other national libraries, such as those of France, Canada, Malaysia and Australia, have also adopted the MARC record structures to create and distribute their national bibliographies.

The Australian national version of MARC is known as AUSMARC. It was developed by the National Library of Australia to produce the Australian national bibliography. Libraries around Australia purchase catalogue records in AUSMARC from the Australian Bibliographic Network (ABN) database (National Library of Australia, 1992: x).

Not every national library uses its bibliography for the same function, nor do they all follow and apply exactly the same set of cataloguing codes and practices in one standard way. Consequently the MARC formats used in individual countries are not identical; they contain variations of the original MARC format.

Along with these national versions of MARC there is an international standard. UNIMARC stands for Universal MARC format. Owing to the different versions of MARC formats that have evolved within countries, it can be difficult and expensive to exchange bibliographic data from one nation to another. Time and money have to be spent converting the MARC format of one national library into the format used by another. UNIMARC aims to address this problem. The idea is that if national libraries agree to exchange their cataloguing data internationally in UNIMARC, they will only have to deal with the conversion of this single MARC format instead of a multiplicity of national MARC standards (Cathro, 1980: 62). Australia, Canada, Japan, Hungary, South Africa, the United Kingdom and the United States of America national libraries have agreed to adopt UNIMARC for international data exchange (Tedd, 1984: 68).

Sources of MARC for Australian school libraries

One of the original advantages of MARC was that it allowed cataloguing data to be loaded into computers which could be programmed to produce catalogue cards. In Australia, MARC is used to produce catalogues in a variety of physical forms. The Schools Catalogue Information Services (SCIS) uses the MARC format to reproduce its catalogue records on cards, bibliographies, microfiche and CD-ROMs specifically for sale to school libraries around Australia. For non-automated schools, these MARC-based products provide an essential means for updating and maintaining their card catalogues. Schools can use microfiche or access via modem the SCIS bibliographic database to search over 500,000 catalogue records. They can order cards, by citing the unique SCIS number (computer generated) attached to each record, to update their collection. The advent of computers in school libraries has led to a more direct use of MARC. Most library automation systems used within schools today have the ability to import MARC records, and many cataloguing modules have MARC at their centre. Automated school libraries are thus able to order their

catalogue records in MARC format on a disk (ASCIS 80) which they load into their computers to update their catalogues. Similarly, school libraries wishing to convert their library collections to an automated system are able to do so via MARC records. Programs such as ASCISRECON enable a school library to bulk order MARC records from the SCIS bibliographic database. The program lets a school customise the MARC records they purchase from SCIS on disk, to suit their local library needs, i.e. adding local call numbers and subject headings. In the near future, SCIS is aiming to capitalise on the flexibility of MARC by introducing the facility for school libraries to dial up the SCIS database and download MARC records directly into their library's automated system.

How MARC works: MARC record structure

Using and understanding a MARC record does not require throwing away AACR2 (Library of Congress, 1988) and learning new cataloguing rules. The same standards and practices used for describing a bibliographic item on a traditional catalogue card are applied to a MARC record. A MARC record just frames the bibliographic information in a format which allows it to be housed and read by a computer. The major part of a MARC bibliographic record consists of *data fields, tags, indicators, subfields* and *subfield codes*. Understanding these terms provides the means to not only read and interpret but to catalogue a MARC record as well. *Note:* All the following examples of MARC are in USMARC format.

a. Data fields and tags

In the traditional card format, one or more elements of similar information are grouped together into the descriptive areas and access points (see Figure 1).

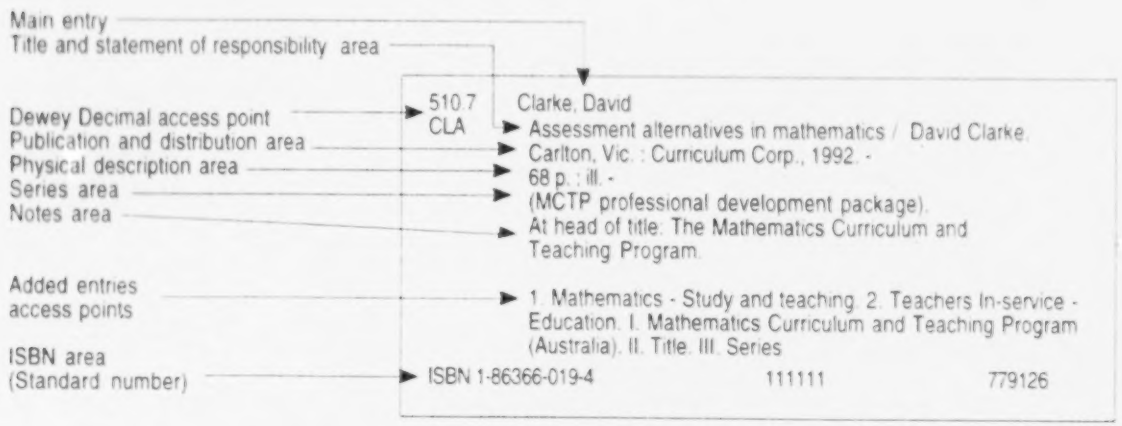

Main entry
Title and statement of responsibility area
Dewey Decimal access point
Publication and distribution area
Physical description area
Series area
Notes area
Added entries access points
ISBN area (Standard number)
510.7
CLA
Clarke, David
Assessment alternatives in mathematics / David Clarke.
Carlton, Vic. : Curriculum Corp., 1992. -
68 p. : ill. -
(MCTP professional development package).
At head of title: The Mathematics Curriculum and Teaching Program.
1. Mathematics - Study and teaching. 2. Teachers In-service - Education. I. Mathematics Curriculum and Teaching Program (Australia). II. Title. III. Series
ISBN 1-86366-019-4
111111
779126

Figure 1: Descriptive areas and access points: traditional card format

MARC records organise bibliographic data in the same way. Each descriptive area and access point in the catalogue record is treated by the computer as a unit of information and is called a *data field* (see Figure 2). Each data field has its own three-character label, normally numeric, called a *tag*. The tag enables the computer to recognise and locate the data field, e.g. the computer knows that title information is always found with tag 245 (the terms 'tags' and 'data fields' will be used interchangeably).

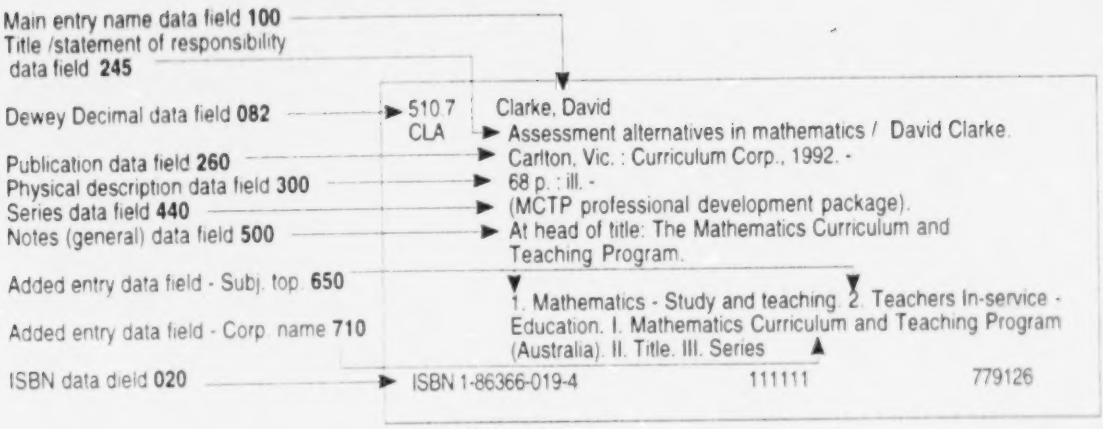

Main entry name data field 100
Title /statement of responsibility data field 245
Dewey Decimal data field 082
Publication data field 260
Physical description data field 300
Series data field 440
Notes (general) data field 500
Added entry data field - Subj. top. 650
Added entry data field - Corp. name 710
ISBN data dield 020
510.7
CLA
Clarke, David
Assessment alternatives in mathematics / David Clarke.
Carlton, Vic. : Curriculum Corp., 1992. -
68 p. : ill. -
(MCTP professional development package).
At head of title: The Mathematics Curriculum and Teaching Program.
1. Mathematics - Study and teaching. 2. Teachers In-service - Education. I. Mathematics Curriculum and Teaching Program (Australia). II. Title. III. Series
ISBN 1-86366-019-4
111111
779126

Figure 2: Descriptive areas and access points: MARC record data fields

Data field tags range from 010, the field for the Library of Congress Cataloguing number, to 9XX, which contains local subject information. A complete list and description of these and other tags are found in any version of a MARC bibliographic format manual, i.e. the tags used in these examples are USMARC and can be found in the three volumes of the *USMARC format for bibliographic data* (Library of Congress, 1988).

Repeatable/non-repeatable tags

A catalogue entry often repeats areas of information such as subjects and added authors. MARC also allows for the repetition of certain tags within a record. Repeatable tags are identified with the letter 'R' just as tags which cannot be used twice in the same record, i.e. 245 (Title data field) and 100 (Main entry data field), are signified with the letters 'NR'.

b. Indicators

Indicators are usually single digit numbers that immediately follow the tags, beginning with 010 on a MARC record. Each field has room for two indicators simply referred to as 'indicator 1' and 'indicator 2'.

Example 1

245 **04** This reads: Tag 245 (Title data field)

- ► indicator 1 = 0 and
- ► indicator 2 = 4

Indicators enable the computer to interpret and supplement the bibliographic information contained within the data field. With tag 245 (Title data field), for example, the number assigned as indicator 1 instructs the computer as to whether or not the title will be required for an added entry, whilst the second indicator interprets the filing arrangement of the title.

Example 2

245 **04** $aThe Wave.

- ►the 1st indicator contains (**0**). This means the title, *The Wave*, will not be treated as a title added entry.
- ►the 2nd indicator equals (**4**). This means there are 4 nonfiling characters in the title (The = 3 characters + 1 space = 4 characters) and the title will be filed under **W**

Not all tags require their indicators to be filled. In the General note field (Tag 500), for example, the indicators are both undefined and left blank (represented as **b**).

Example 3 500 **bb**

Some tags, such as Tag100 (Main entry personal name data field), only require their first indicator to be used with the second indicator left undefined or vice versa.

Example 4 100 **3b**

The meanings of indicators vary from tag to tag. An explanation of the indicators and the function they perform within each data field appears at the beginning of each tag description set out in a MARC bibliographic format manual.

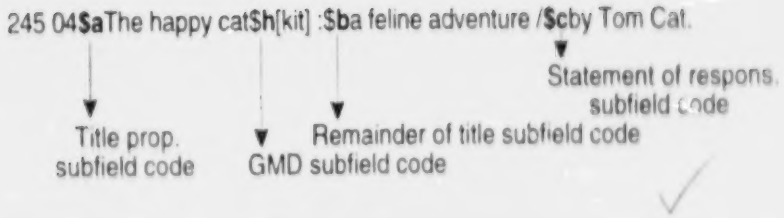
c. Subfields

In the bibliographic description of a work, each area of description and access point can be subdivided into one or many elements. A title paragraph, for example, can be subdivided into title proper, GMD, parallel title, other title information and first and subsequent statements of responsibility. Each of these elements has its own set of standards for description. In MARC formats these subdivisions of information contained within a data field are called *subfields* (e.g. Title proper subfield, GMD subfield). The number of subfields varies from tag to tag, but all tags, beginning with 010, have at least one subfield.

Subfield codes

The subfield is always preceded by a subfield code. The code lets the computer identify the subfield and recognises that the information it contains requires separate treatment. The subfield code is composed of two characters: a delimiter (commonly represented by a dollar sign **$**) and a single character (normally a lowercase letter).

Example 5


245 04$aThe happy cat$h[kit] :$ba feline adventure /$cby Tom Cat.
Statement of respons. subfield code
Title prop. subfield code
GMD subfield code
Remainder of title subfield code

The meanings of each subfield code usually vary from tag to tag, i.e. with Tag 245, the subfield code **$b** identifies the remainder of title information, whilst with Tag 700 (Added entry - personal name field) **$b** identifies numeric bibliographic data.

Certain subfields, like data fields, can be repeated in a MARC record. Repeatable and non-repeatable subfields are identified in format manuals respectively with the letters 'R' and 'NR'. Every possible subfield that can be used with each tag is listed and explained in MARC format manuals.

Other MARC format terms

Along with the data fields, tags, subfields and subfield codes there are other components of a MARC record: the *Leader*, *Directory* and *Control fields*. These consist largely of codes, some added automatically by the computer and others by the cataloguer, that provide additional information about the record. This information is not found on your standard catalogue card but is needed by the computer to process the record efficiently (Eppelheimer, 1991: 3).

d. Leader

The first 24 characters make up the *Leader*. This contains codes which enable the computer to recognise and handle the record. Codes record information such as the length of the record, the bibliographic level of the record (e.g. monograph, serial) and cataloguing standard used to describe the record (i.e. AACR2, AACR1, etc.).

e. Directory

The *Directory* must be present in every MARC record. The computer reads it like a contents page or map to locate quickly information contained within the MARC record. It is basically a string of compressed numbers containing the tags and the length and starting position of each field in the record (Eppelheimer, 1991: 3). The computer automatically generates this information.

f. Control fields

Control fields have tags beginning with 00 and are different from data field tags in that they do not have indicators or subfields. They provide the computer with the additional information it needs to read and retrieve information within the record. Control field 001 contains the record identifier – a unique number assigned by the computer to each record enabling it to be recognised and linked to related records. The 008 control field contains information codes which, among other things, identify the intellectual level of the audience (e.g. secondary, tertiary).

Reading and cataloguing with MARC records

333.707 LIFT-OFF to the environment [kit] : video
LIF and book package. -
Carlton, Vic. : Curriculum Corp. , 1993.
1 video cassette, 1 book. - (Lift off in the classroom).
Book written by Marie Kick.

1. Lift-off (Television program).
2. Education, Primary - Curriculums. 3. Television in education. 4. Environment - Study and teaching.
5. Conservation of natural resources - Study and teaching. I. Kick, Marie. II. Australian Children's Television Foundation. III. Curriculum Corporation.

ISBN 1-86366-085-2 111111 784732

Figure 3: Shelf list card from SCIS (not actual size)

ISBN	020	bb	$a1863660852
Call N	082	04	$a333.707$bLIF$220
Title	245	00	$aLift-off to the environment$h[kit] :$bvideo and book package.
Pub	260	bb	$aCarlton, Vic. :$bCurriculum Corp.,$c1993.
Phys	300	bb	$a1 video cassette, 1 book.
Series	440	b0	$aLift off in the classroom
Note	500	bb	$aBook written by Marie Kick.
Sub	630	04	$aLift-off (Television program)
Sub	650	b4	$aEducation, Primary$xCurriculums.
Sub	650	b4	$aTelevision in education.
Sub	650	b4	$aEnvironment$xStudy and teaching.
Sub	650	b4	$aConservation of natural resources$xStudy and teaching.
Name	700	10	$aKick, Marie.
Corp.N	710	21	$aAustralian Children's Television Foundation.
Corp.N	710	21	$aCurriculum Corporation.

Figure 4: MARC OPAC screen

Figure 3 depicts a catalogue card produced by the SCIS database. Figure 4 shows the same record in MARC (USMARC) format on an OPAC (online public access catalogue) screen. On the following pages, a step-by-step demonstration is presented explaining how the data from the card (Figure 3) are coded into the USMARC format (Figure 4).

A description of each tag with its indicators and subfield codes used to construct the record appears on the left-hand side. These are taken from *USMARC format for bibliographic data* (Library of Congress, 1988). *Note:* Only those tags needed to construct this record are explained. Similarly, not every indicator or subfield code that can be used with each tag is represented.

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About the MARC format examples

Preceding each tag description is an extract from the sample SCIS card (Figure 3). The area of the card represented by the tag under discussion is shown in bold highlight. Examples showing how the information on the card is then coded into indicators and subfields appear on the right-hand side of the tag description. At the end of each tag explanation is a detail of the OPAC screen (Figure 4), depicting the highlighted data from the catalogue card as it would appear in a MARC record. *Note:* For clarity's sake indicators are shown separated with spaces from the tags and subfield codes.

a. International Standard Book Number (ISBN)

Card format (extract from Figure 3)

5. Conservation of natural resources - Study and teaching. I. Kick, Marie II. Australian Children's Television Foundation III. Curriculum Corporation

ISBN 1-86366-085-2 111111 784732

(Tag) 020 ISBN (R)

Indicators: Undefined; each contains a blank (b) → Indicators = **b**

Subfield codes
$a ISBN (NR) → **$a1863660852**
$c Terms of availability (NR)
$z Cancelled/invalid ISBN (R)

MARC OPAC (extract from Figure 4)

ISBN **020 bb $a1863660852**

b. Dewey Decimal Call Number

Card format (extract from Figure 3)

333.707 Lift-off to the environment [kit] :
LIF video and book package

(Tag) **082 Dewey Decimal Call Number (R)**

First Indicator: Type of edition
0 Full edition → 1st indicator = **0**
1 Abridged
Second Indicator: Source of call number
0 Assigned by LC
4 Assigned by agency other than LC → 2nd indicator = **4** *(SCIS agency)*

Subfield codes
$a Classification number (R) → **$a337.707**
$b Item number (NR) → **$bLIF**
$2 Edition number (NR) → **$220** ***(ie Dewey 20)***

MARC OPAC (extract from Figure 4)

ISBN 020 bb $a1863660852
Call N 082 04 $a333.707$bLIF$220

c. *Title and statement of responsibility*

Card format (extract from Figure 3)

333.707 LIF
LIFT-OFF to the environment [kit] : video and book package. -
Carlton, Vic. : Curriculum Corp. , 1993.

(Tag) 245 Title Statement (NR)

First Indicator: Title added entry.
0 No title added entry → 1st indicator = **0** *(as the title is main entry no title added entry required.)*
1 Title added entry

Second Indicator: Nonfiling characters → 2nd indicator = **0** *(No nonfiling words)*
0-9 Number of nonfiling characters present.

Subfield codes
$a Title (proper) (NR) → **$a**Lift-off to the environment :

$h Medium (GMD) (NR) → **$h** [kit] :
$c Remainder of title page/statement of respons. (NR)

$b Remainder of title (NR) → **$b**video and book package

MARC OPAC (extract from Figure 4)

ISBN	020 bb	$a1863660852
Call N	082 04	$a333.707$bLIF$220
Title	**245 00**	**$aLift-off to the environment$h[kit] :$bvideo book and package.**

d. Publication

Card format (extract from Figure 3)

333.707 LIF	LIFT-OFF to the environment [kit] : video and book package. - **Carlton, Vic. : Curriculum Corp. , 1993.**

(Tag) 260 Publication, Distribution, etc. (NR)

Indicators: Undefined	1st & 2nd indicators = **b**
Subfield codes:	
$a Place of publication (R)	**$a**Carlton, Vic. :
$b Name of publisher (R)	**$b**Curriculum Corp.,
$c Date of publication (R)	**$c**1993.

MARC OPAC (extract from Figure 4)

ISBN	020 bb	$a1863660852
Call N	082 04	$a333.707$bLIF$220
Title	245 00	$aLift-off to the environment$h[kit] :$bvideo and book package.
Pub	**260 bb**	**$aCarlton, Vic. :$bCurriculum Corp.,$c1993.**

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e. Physical description (collation)

Card format (extract from Figure 3)

LIFT-OFF to the environment [kit] : video
and book package. -
Carlton, Vic. : Curriculum Corp. , 1993.
1 video cassette, 1 book. - (Lift off in the classroom).

(Tag) 300 Physical Description (R)

Indicators: Undefined → Indicators = **b**
Subfield codes:
Sa Extent (number of pages, cassettes) (NR) → **$a**1 video cassette, 1 book
$b Other physical details (NR) (illustrations, colour etc.)
$c Dimensions (R)

MARC OPAC (extract from Figure 4)

ISBN	020 bb	$a1863660852
Call N	082 04	$a333.707$bLIF$220
Title	245 00	$aLift-off to the environment$h[kit] :$bvideo and book package.
Pub	260 bb	$aCarlton, Vic. :$bCurriculum Corp.,$c1993.
Phys	**300 bb**	**$a1 video cassette, 1 book.**

f. Series title

Card format (extract from Figure 3)

LIFT-OFF to the environment [kit] : video
and book package -
Carlton, Vic. : Curriculum Corp. , 1993.
1 video cassette, 1 book. - **(Lift off in the classroom).**

(Tag) 440 Series Title/Added entry-Title (R)

First Indicator: Undefined. → 1st indicator = **b**

Second Indicator: Nonfiling characters. → 2nd indicator = **0**
0-9 Number of nonfiling characters present. *(No nonfiling words present)*

Subfield codes:
$a Title (NR) → **$aLift off in the classroom**
(No parentheses required in MARC record.)
$v Volume number (NR)
$x ISSN (NR)

MARC OPAC (extract from Figure 4)

ISBN	020	bb	$a1863660852
Title	245	00	$aLift-off to the environment$h[kit] :$bvideo and book package.
Call N	082	04	$a333.707$bLIF$220
Pub	260	bb	$aCarlton, Vic. :$bCurriculum Corp.,$c1993.
Phys	300	bb	$a1 video cassette, 1 book.
Series	**440**	**b0**	**$aLift off in the classroom**

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g. General note

Card format (extract from Figure 3)

333.707 LIF	LIFT-OFF to the environment [kit] : video and book package. - Carlton, Vic. : Curriculum Corp. , 1993 1 video cassette, 1 book. - (Lift off in the classroom). **Book written by Marie Kick.**

(Tag) **500 General Note (R)**

Indicators: Undefined ——► indicators = b

Subfield codes:

$a General note (NR) ——► $a**Book written by Marie Kick.**

MARC OPAC (extract from Figure 4)

ISBN	020	bb	$a1863660852
Title	245	00	$aLift-off to the environment$h[kit] :$bvideo and book package.
Call N	082	04	$a333.707$bLIF$220
Pub	260	bb	$aCarlton, Vic. :$bCurriculum Corp.,$c1993.
Phys	300	bb	$a1 video cassette, 1 book.
Series	440	b0	$aLift off in the classroom
Note	**500**	**bb**	**$aBook written by Marie Kick.**

h. Added entries

Card format (extract from Figure 3)

1. **Lift-off (Television program).**
2. Education, Primary - Curriculums. 3. Television in education. 4. Environment - Study and teaching.

(Tag) 630 Subject Added entry-Uniform title (R)

First Indicator: Nonfiling characters → 1st indicator = **0**
0-9 Number of nonfiling characters in title.

Second Indicator: Subject heading system
0 Library of Congress Subject Headings
4 Source not specified → 2nd indicator = **4**
(At present, no source code has been specified for SCIS subject headings.)

Subfield codes:
$a Uniform title (NR) → **$a**Lift-off (Television program)
$x General subdivision (R)
$y Chronological subdivision (R)
$z Geographic subdivision (R)

MARC OPAC (extract from Figure 4)

ISBN	020	bb	$a1863660852
Title	245	00	$aLift-off to the environment$h[kit] :$bvideo and book package.
Call N	082	04	$a333.707$bLIF$220
Pub	260	bb	$aCarlton, Vic. :$bCurriculum Corp.,$c1993.
Phys	300	bb	$a1 video cassette, 1 book.
Series	440	b0	$aLift off in the classroom
Note	500	bb	$aBook written by Marie Kick.
Sub	**630**	**04**	**$aLift-off (Television program)**

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i. Added entry - Subject topical

Card format (extract from Figure 3)

1. Lift-off (Television program).
2. Education, Primary - Curriculums. 3. Television in education. 4. Environment - Study and teaching. 5. Conservation of natural resources - Study and teaching. I. Kick, Marie. II. Australian Children's

(Tag) 650 Subject Added entry-Topical term (R)

First Indicator: Level of subject
b No information available ► 1st indicator = **b**
(Note: This is an example where b has a meaning.)
0 No level specified
1 Primary subject
2 Secondary subject

Second Indicator: Subject heading system
0 Library of Congress subject headings or LC authority file
4 Source not specified 2nd indicator = **4**

Subfield codes:
$a Topical term as entry element (NR) ► **$a**Education, Primary

$x General subdivision (R) ► **$x**Curriculums
$y Chronological subdivision (R)
$z Geographic subdivision (R)

Note: The above process is repeated for the other 3 topical added entries represented in our sample record. See below:

MARC OPAC (extract from Figure 4)

ISBN	020 bb	$a1863660852
Title	245 00	$aLift-off to the environment$h[kit] :$bvideo and book package.
Call N	082 04	$a333.707$bLIF$220
Pub	260 bb	$aCarlton, Vic. :$bCurriculum Corp.,$c1993.
Phys	300 bb	$a1 video cassette, 1 book.
Series	440 b0	$aLift off in the classroom
Note	500 bb	$aBook written by Marie Kick.
Sub	630 04	$aLift-off (Television program)
Sub	**650 b4**	**$aEducation, Primary$xCurriculums.**
Sub	**650 b4**	**$aTelevision in education.**
Sub	**650 b4**	**$aEnvironment$xStudy and teaching.**
Sub	**650 b4**	**$aConservation of natural resources$xStudy and teaching.**

j. Added entry - Personal name

Card format (extract from Figure 3)

2. Education, Primary - Curriculums. 3. Television in education. 4. Environment - Study and teaching. 5. Conservation of natural resources - Study and teaching. **I. Kick, Marie**. II. Australian Children's

(Tag) 700 Added entry- Personal name (R)

First Indicator: Personal name
0 Forename
1 Single name → 1st indicator = 1
2 Multiple surname
3 Family name

Second Indicator: Type of added entry
0 Alternative entry *(likely to be thought of as an author)* 2nd indicator = 0
1 Secondary entry
2 Analytical entry

Subfield codes:
$a Personal name (NR) → $aKick, Marie.
$b Numeration (NR)

MARC OPAC (extract from Figure 4)

ISBN	020	bb	$a1863660852
Title	245	00	$aLift-off to the environment$h[kit] :$bvideo and book package.
Call N	082	04	$a333.707$bLIF$220
Pub	260	bb	$aCarlton, Vic. :$bCurriculum Corp.,$c1993.
Phys	300	bb	$a1 video cassette, 1 book.
Series	440	b0	$aLift off in the classroom
Note	500	bb	$aBook written by Marie Kick.
Sub	630	04	$aLift-off (Television program)
Sub	650	b4	$aEducation, Primary$xCurriculums.
Sub	650	b4	$aTelevision in education.
Sub	650	b4	$aEnvironment$xStudy and teaching.
Sub	650	b4	$aConservation of natural resources$xStudy and teaching.
Name	**700**	**10**	**$aKick, Marie.**

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k. Added entry - Corporate name

Card format (extract from Figure 3)

5. Conservation of natural resources - Study and teaching. I. Kick, Marie. **II. Australian Children's Television Foundation. III. Curriculum Corporation.**

(Tag) **710 Added entry-Corporate name (R)**

First Indicator: Type of corporate name
0 Inverted name
1 Jurisdiction name
2 Name in direct order → 1st indicator = 2

Second Indicator: Type of added entry
0 Alternative entry
1 Secondary entry *(of lesser importance than author)* → 2nd indicator = 1
2 Analytical entry

Subfield codes:
$a Corporate name (NR) → $aAustralian Children's Television Foundation
$b Subordinate unit (R)
$c Location of meeting (NR)

Note: Above process is repeated for the second Corporate name added entry in our sample record. See below:

MARC OPAC (extract from Figure 4)

ISBN	020 bb	$a1863660852
Title	245 00	$aLift-off to the environment$h[kit] :$bvideo and book package.
Call N	082 04	$a333.707$bLIF$220
Pub	260 bb	$aCarlton, Vic. :$bCurriculum Corp.,$c1993.
Phys	300 bb	$a1 video cassette, 1 book.
Series	440 b0	$aLift off in the classroom
Note	500 bb	$aBook written by Marie Kick.
Sub	630 04	$aLift-off (Television program)
Sub	650 b4	$aEducation, Primary$xCurriculums.
Sub	650 b4	$aTelevision in education.
Sub	650 b4	$aEnvironment$xStudy and teaching.
Sub	650 b4	$aConservation of natural resources$xStudy and teaching.
Name	700 10	$aKick, Marie.
Corp.N	**710 21**	**$aAustralian Children's Television Foundation.**
Corp.N	**710 21**	**$aCurriculum Corporation.**

MARC: recent developments

In 1991, the National Library of Australia announced that the USMARC format would replace AUSMARC as the MARC standard for exchange of machine-readable records within Australia. This is to take place some time after 1994 when ABN is re-developed (National Library of Australia, 1992). The following discussion examines the effects this development with MARC has had on the operations of the SCIS organisation.

AUSMARC to USMARC at SCIS

Background

Since 1984, SCIS has used MARC records (AUSMARC) to export its bibliographic records and to produce a range of catalogue products such as microfiche and ASCISRECON. SCIS has used the DOBIS/ LIBIS library software platform to store its data. In 1991, Curriculum Corporation decided the time was right to secure a new software platform for the SCIS database as the existing DOBIS/LIBIS system, whilst presenting an excellent cataloguing module, was becoming outdated and expensive to maintain. In 1993, Curriculum Corporation, after an extensive search, selected the Voyager software system from MARCorp of San Mateo, California, as the new software host. This American library software package is designed to process USMARC formatted data whilst the present SCIS database exports its records in AUSMARC. Given the National Library's decision to introduce USMARC as the national exchange standard and to avoid a costly modification of the Voyager system from USMARC to AUSMARC, it was decided that SCIS would convert to and export its bibliographic database in USMARC.

Conversion difficulties

Whilst notification of this change was sent to all school library software suppliers to prepare their automated systems for USMARC records, staff at SCIS and its facilities management contractor, Ferntree Computer Corporation, began the task of converting the SCIS database from AUSMARC to USMARC.

The first step in this task was to establish which AUSMARC codes SCIS used to export its data. This process revealed two problems. Firstly, SCIS data are stored in the language of the DOBIS/LIBIS system. This is not a MARC format and consequently it cannot be exported from one site to another. The SCIS data are thus converted from these codes to AUSMARC. Slight modifications had been made to some AUSMARC codes to accommodate the DOBIS/LIBIS language which in effect meant that SCIS's version of AUSMARC was not quite pure. Secondly, records were also discovered with incorrect AUSMARC coding. These errors and modifications had to be corrected before the conversion to USMARC.

AUSMARC versus USMARC

After confirming the AUSMARC codes used to format the SCIS data, the next step was to compare the AUSMARC codes with those of USMARC . The USMARC concise and full format volumes were essential to this task. These manuals were ordered from the Library of Congress and took quite a while to arrive; therefore, some delay was experienced before this vital step in the conversion could begin.

With the AUSMARC and USMARC formats in hand, a detailed cross check and comparison of the AUSMARC and USMARC tags was undertaken. This task was not as straightforward as it appeared. Unfortunately, as the following examples illustrate, it was

discovered that not every AUSMARC tag, indicator and subfield code has an exact partner in USMARC (see examples 6 and 7). In many cases AUSMARC tags offer a wider range of subfields than USMARC, or they provide subfields that can be repeated with the AUSMARC tag but not with the USMARC (see example 8).

Example 6 : Different subfield codes

With the AUSMARC personal name tags, 100, 600, 700 and 800, there is a subfield code for surname (**$a**) and one for given names (**$h**). In USMARC, however, all of the name information must be placed in the one subfield (**$a**)

AUSMARC: 100 10 $a**C**larke$h**D**avid
USMARC : 100 1b $a**C**larke, David.

Example 7 : Different tags and indicators

With the AUSMARC tags for corporate names, 110, 610, 710 and 810, the name of a direct order conference name is recorded with the first indicator position equal to 3. In USMARC this information is placed with a completely different set of tags, i.e. 111, 611, 711 and 811.

AUSMARC: **110** 30 $aExpo 70$j**O**saka, Japan
USMARC : **111** 2b $aExpo 70$c(**O**saka, Japan)

Example 8 : Different repeatable subfields

With AUSMARC Tag 245 all subfields except for $m (GMD) can be repeated. With USMARC Tag 245 only a few of these subfields can be repeated. The data normally placed in the repeated AUSMARC subfield have to be inserted into a single USMARC subfield.

AUSMARC: 245 14 $a**T**he cat's claw$a**T**he dog's teeth$d**R**. Rover
USMARC: 245 14 $a**T**he cat's claw. The dog's teeth /$c**R**. Rover.

Differences, as illustrated in these examples, between the two MARC codes occur frequently, all of which had to be carefully incorporated into the conversion program.

Punctuation

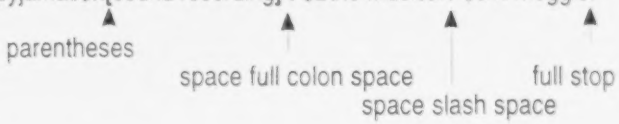
Once all the AUSMARC data and control fields and the leader had been matched to their USMARC counterparts, the next major stage of the conversion involving punctuation was addressed. This proved to be a major headache. The problem boiled down to the fact that USMARC records require, in the majority of instances, punctuation to be included with the bibliographic data and AUSMARC does not. In other words, USMARC requires the cataloguer to insert punctuation when creating the record and AUSMARC does not. The following examples illustrate some of the problems this fundamental difference between these two versions of MARC presented for the conversion process at SCIS.

Example 9

In a USMARC Tag 245 (Title data field) with subfields $h (GMD), $b (Additional title information) and a $c (Statement of responsibility), the **$h** data requires parentheses, the **$b** subfield needs to be preceded with a space colon space and the **$c** requires a preceding space slash space. The field ends with a full stop. The equivalent subfields in AUSMARC Tag 245 require no such punctuation with the data.

AUSMARC
245 14 **$a**The cat's pyjamas**$m**sound recording**$b**the musical**$d**T. Moggie

USMARC
245 14 **$a**The cat's pyjamas**$h**[sound recording] : **$b**the musical / **$c**T. Moggie.



AUSMARC relies on output programs (those written to produce cards, microfiche) to insert the appropriate punctuation. If this part of the conversion were not handled correctly, two problems would occur. Firstly, the SCIS records on the new Voyager database would display some records with punctuation and others without or with incorrect punctuation. Secondly, output products such as the cards and microfiche would duplicate these errors.

The next task involved identifying what and where each mark of punctuation was required and incorporating into the conversion program a component which would insert appropriate punctuation into all the records on the SCIS database. This was complicated when confronted with certain tags such as 110, 610, 710 and 810 where the type of punctuation applied to a particular subfield is determined by the nature of the other subfield codes appearing in the field.

Example 10

With Tag 110, if the $d (date of meeting subfield code) is preceded by a $n subfield code, a space colon space must precede the $d.

110 2b $aCatholic Church.$bPlenerary Council**$n**(2nd **: $d**1866)

Yet if there is no $n in the field, this particular punctuation is not required.

110 2b $aCatholic Church.$bPlenerary Council**$d**(1866 :$cRome, Italy)

At the time of writing this paper, the conversion program has been completed and sample tapes of SCIS data in USMARC format have been produced consisting of around 30,000 records. Initial test results have been encouraging, with only a small percentage of records being 'dropped' because they cannot find a USMARC address. These errors occurred because of mistakes in the original SCIS data, such as incorrect AUSMARC coding, which had escaped earlier checking procedures. Preliminary testing has also indicated that the insertion of punctuation into the SCIS data is progressing well.

At the end of 1994, after continual testing of the conversion program, the entire SCIS database will be converted to USMARC and a tape carrying the data will be sent to the United States for loading into the new software platform. On its return, extensive testing will be undertaken which will involve running the two databases, Voyager and DOBIS/LIBIS, side by side to ensure, among other things, that the conversion from AUSMARC to USMARC has been successful.

Conclusion

Using MARC does not require a teacher-librarian to have a deep understanding of computers. A MARC record, whether it be in AUSMARC or USMARC format, contains the same information found on the humble catalogue card but arranges it in such a way that it can be read and managed by a computer. MARC assists both non-automated and automated school libraries alike. In regard to the former, MARC enables the production of essential library catalogue resources, such as cards and microfiche, giving teacher-librarians access to thousands of bibliographic records. For automated school libraries, MARC provides the means for the exchange of catalogue records from a central database via disks which can be loaded into cataloguing modules and altered to suit a library's local needs. MARC therefore enables libraries to share cataloguing information and reduces the time teacher-librarians must spend on manually maintaining their library catalogues.

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Providing Access to Fiction in School Libraries: Some Thoughts and Observations

Ashley Freeman

'Once upon a time' fiction collections within school libraries were almost exclusively used for recreational reading. Access to the fiction collection provided through the card catalogue was also limited, generally comprising only author and title entry points (although some catalogues also provided access by illustrator and series). Over the past two decades, however, fiction has assumed a far more significant role in education. While the recreational role continues to be emphasised, fiction is also being used in a variety of ways within the curriculum to foster, enhance and support learning. Teacher-librarians are increasingly fielding requests for fiction resources on topics as diverse as echidnas, fear, whales, mental illness, UFOs and death – with the material generally needed immediately! Students are also seeking more support in their search for 'a good read', frequently requesting works within a certain genre, format or reading level. This diversified and extensive use of fiction has resulted in a growing need for improved access to fiction through the library catalogue. There is little point in having a marvellous fiction collection if teachers and students (and indeed the teacher-librarian) experience difficulty and frustration in trying to find the fiction works they want and need.

The purpose of this paper is to examine and consider ways in which this improved access to fiction might be provided. The ideas and opinions expressed in this article are not the result of any formal study, but arise from the observations and experiences of the author and discussions with teacher-librarians. Therefore, no firm conclusions are offered, and all ideas expressed are open to challenge. The author is now undertaking a comprehensive study of this complex and often neglected topic.

Many teacher-librarians recognise the need to provide improved access to fiction and are seeking to achieve that goal in a variety of ways. One of the methods commonly employed by teacher-librarians involves consideration of the physical arrangement of the fiction collection. This approach recognises that browsing is a major method by which users search for the fiction resources they want, but that the standard physical arrangement of fiction – alphabetical order by author – only effectively assists those browsers who search by author. The teacher-librarian seeks to assist the browsing process by providing other reference points in addition to author. These might involve: dividing the fiction collection by format, e.g. picture books and novels or hardcover and paper back, or ability levels, e.g. easy fiction, junior fiction and senior fiction; grouping popular series together; indicating the genre to which each fiction work belongs by placing a particular colour dot or shape on the item; creating displays of fiction works on particular themes or topics; or adapting shelving so that as many fiction works as possible are displayed by their covers rather than their spines. These methods have frequently had considerable success, particularly within primary schools, in assisting users locate works of fiction. Such methods, however, need to be clearly focused on the needs and wants of the users or they can fail miserably. For example, arrangement by ability level can leave older less able readers reluctant to select from the 'little kids' section.

A second approach employed to increase access to fiction is through the creation or purchase of select bibliographies and indexes. Many teacher-librarians develop lists of

resources, including fiction resources, for popular topics and units studied within their schools. These lists are commonly additional to, rather than devised from, the catalogue. The publishing world has also recognised this market and there is a growing number of commercially produced fiction indexes and bibliographies available providing a mix of author, title, subject and genre access to the fiction they list. These are normally in book form and include:

A-Z of themes I and II
A to zoo: Subject access to children's picture books, 4th edn.
Australian children's fiction: The subject guide
Black in focus: A guide to Aboriginality in literature for young people
Real books for the (less) successful reader
Subject guide to Australian children's books in print, 2nd edn.

Select lists of fiction arranged by genre, subject or interest/ability levels also frequently appear in periodicals such as *SCAN*, *Magpies* and *The Literature Base*. We can also expect to see a number of, principally American, CD-ROMs appearing in this field such as Bowker's *Children's reference plus*.

While such bibliographies and indexes have frequently proved a beneficial resource, they also have limitations. The commercial sources tend to date quickly and many of the resources mentioned may not be available in the school library. The inhouse lists, while directly pertinent to the needs of the school, require time to develop and update and can realistically only cover a small percentage of the diverse requests for fiction resources that the teacher-librarian is likely to receive.

The third approach that is used to increase access to literature is through the catalogue. We frequently speak of the catalogue as being the 'key' to the collection, that is the primary access point to the library's resources. With regard to fiction, however, teacher-librarians have tended to develop access by physical arrangement or through select bibliographies and indexes first and largely to neglect access through the catalogue. While these alternate methods are frequently valuable, the access they provide could also be developed and maintained (and more thoroughly and fully) through the catalogue, especially now that catalogues in school libraries are increasingly powerful and flexible OPACs (online public access catalogues) rather than the far more limited card catalogues. Why then have we tended to neglect this key access point?

Many teacher-librarians would argue that access through the catalogue has not been neglected. This is true in the sense that since 1986 the School Cataloguing Information Service (SCIS) has been providing subject headings for some 'significant' works of fiction on its catalogue records. These subject headings are of the following types:

'Non-fiction' based headings – 'Works of fiction may be given headings according to the persons, places, themes or topics with which they deal' (*SCIS Subject Headings List*, 1994: 319). These subject headings are created by adding the standard subdivision '- Fiction' to accepted 'non-fiction' subject headings, e.g.

Atlantis - Fiction
Cook, James - Fiction
Honesty - Fiction
Insects - Fiction
Queensland - History - 1824-1859 - Fiction
Rocks (Sydney, N.S.W.) - Fiction
Rodeos - Fiction

This is the most common type of fiction subject heading seen on SCIS catalogue records, there being approximately 3500 of them on the SCIS database. (There are over 280 such

subject headings between 'Aardvarks' and 'Aztecs' alone.) While some of the more uncommon of these such as Greeks in Sweden - Fiction would only have been given to one or two fiction works, others such as Ghosts - Fiction would be found on the catalogue records of several works. Therefore, it can be broadly estimated that there could be several thousand fiction works with such subject headings.

Language – if a fiction work is in a language other than English, it is given a subject heading which indicates the language in which it is written, e.g.

French language text
German language text
Japanese language text
Maltese language text
Chinese language text

Literary prizes – if a fiction work has won a literary prize, it can be given the name of the prize as a subject heading, e.g.

Book of the Year Award
Carnegie Medal
Newbery Medal
KOALA (Literary prize)
Greenaway Medal

While the access provided by SCIS fiction subject headings is a significant addition to the traditional fiction access points provided through the catalogue, there is growing concern that the SCIS approach to providing access to fiction is too limited and does not adequately meet the need for access to fiction. These concerns or criticisms normally fall into the following categories:

a. Limitations on use – there are a number of restrictions on the use of the SCIS fiction subject headings. They are only assigned to fiction works which are judged to be 'significant' works of fiction, e.g. '...the work describes with special vividness and versimilitude an historical period or event of potential interest to students', and/or ' ...the work contains themes or topics of potential curriculum relevance, especially those relating to aspects of contemporary society' (Curriculum Corporation Standards for Cataloguing and Data Entry, 1991: 89).

This suggests that only a minority of fiction works may be being assigned SCIS subject headings. Additionally SCIS cataloguers are instructed when assigning fiction subject headings '...that the task should be promptly abandoned if the required information is not readily available [from the blurb and by skimming the contents] or if any doubt arises about whether any heading should be assigned or what it might be' (*Curriculum Corporation standards for cataloguing and data entry*, 1991: 90), thus discouraging the provision of subject access to 'complex' fiction works.

b. The 'non-fiction' nature of SCIS subject headings is not always suitable for the classification of fiction. Kerry White, who used SCIS subject headings as her main reference when compiling her *Australian children's literature: the subject guide*, commented: '...it has also been necessary to make adjustments so that some prominent features of fiction for children can be acknowledged. This has been particularly necessary in the areas of behaviour and emotions. For example, it is worthwhile to include such headings as "Anticipation", "Bullying" or "Imaginary friends" and it was necessary to subdivide a heading like "Friendship" to make it more useful' (White, 1993: x).

c. Many desired access points to fiction are either not provided or specifically disallowed. Genre is an interesting case in point. Despite the evident demand for genre subject headings for fiction works, SCIS does not support their use, 'Because of the commitment to provide access to topic information contained in works of fiction rather than any aspiration to enable its subject cataloguing directly to support literature programs in schools' (*Curriculum Corporation standards for cataloguing and data entry*, 1991: 90). This is despite a variety of other literary forms or genres being accredited SCIS subject headings, e.g. 'Allegories', 'Fables', 'Folklore', 'Humorous poetry', 'Jokes', 'Limericks', 'One act plays' and 'Parables'; the fact that a few specific fiction genres are recognised SCIS subject headings such as 'Science fiction' and 'Historical fiction' but their use is restricted to works about that genre, rather than within it; and the existence of a number of de facto fiction genre headings on the SCIS database such as 'Animals - Fiction', 'Detectives - Fiction', 'Family relations - Fiction' and 'Ghosts - Fiction'.

The evident demand and need for genre headings are demonstrated by the fact that since mid-1993 cataloguers working for the Western Australian Ministery of Education have been adding genre headings to the SCIS catalogue records of 'appropriate' fiction works for Western Australian government schools. These genre headings were determined by a survey of Western Australian teacher-librarians and are as follows:

Adventure stories
Animal stories
Australian stories
Crime
Family sagas
Fantasy
Historical fiction
Horror
Humour
Mystery
Romance
Science fiction
Supernatural

These genre headings are included in the subject field of the catalogue record together with any assigned SCIS subject headings.

If then it is true that the level of access to fiction resources provided through SCIS records is widely felt to be inadequate, why have there not been changes and additions to this access? Possible reasons are:

a. When the current SCIS cataloguing standards were determined, most school libraries had card catalogues. Therefore, limiting the number and range of access points was a practical measure, limiting the number of cards which needed to be generated, filed and managed to a reasonable level. The widespread adoption of OPACs in school libraries is altering this situation as OPACs allow far easier insertion and management of catalogue records. Thus the number and range of access points can be far more extensive on OPACs without creating undue problems for the teacher-librarian. However, there still remain a number of school libraries using card catalogues. While their numbers are declining, their needs must, for the present, continue to be considered.

More significantly, before there can be changes to SCIS records there needs to be confidence that the changes contemplated will serve the needs of Australian and New Zealand schools into the future; consensus among the various educational authorities involved in the management of SCIS as to the nature of these changes; and construction of the guidelines, authorities and procedures needed to bring about these changes. All this takes time.

b. Individual teacher-librarians can develop their own methods of enhancing access to fiction through the catalogue. OPACs have certainly assisted in making this a feasible and manageable proposition. However, the lack of time and in some cases the necessary skills to determine, formulate, implement and maintain the changes needed to provide the desired access to fiction in an appropriate and consistent manner have deterred many teacher-librarians from undertaking this task. These difficulties could be largely overcome if there were a range of models, schemes and methods for providing access to fiction from which individual teacher-librarians could choose, and adapt where required, a system appropriate to the needs of specific schools. Unfortunately, there is little about such schemes in the literature.

Possibly the best known scheme available is the 'Leefiction' scheme developed by John Lee when he was teacher-librarian at Muldoon Information and Resources Centre, a shared facility between Mater Dei and Corpus Christi Colleges on the New South Wales Central Coast. Lee recognised that OASIS Library created the opportunity to provide far more access points to fiction than those provided on SCIS records. Lee's scheme, which is detailed in a workshop paper presented at the Twelfth Biennial Conference of the Australian School Library Association (Lee, 1991) and in a self-published booklet (Lee, undated), provides twelve 'subject' access points to fiction works - Genre, Aspect, Issue, Era, Setting, Format, Medium, Characters, Awards, Level, Rating and Review. Ten of these headings are included in the subject field, while two – Characters and Review – are placed in the notes field with keywords tagged.

Issues, ***Era***, ***Setting***, ***Characters*** and ***Awards*** broadly cover the same aspects covered by SCIS subject headings except that Lee's headings are much more liberal and extensive; the subdivision '- Fiction' is not used, and Lee's headings are given to all the fiction works to which they apply.

Lee's first access point is ***Genre*** - the genres he uses are:

Fantasy	Mystery
Science fiction	Romance
School	Family
Adventure	Stories of today (Contemporary)
Animal	Stories of yesterday (Historical fiction)
Fun (Humour)	War

The second access point – ***Aspect*** – is closely related, being subdivisions of the above genres, thus in effect providing access by broad genre and subgenres. Aspects of Lee's Fantasy genre include Quest, Animal, Time shift, Ghost, Horror, In miniature, Witchcraft/occult and Mythical.

The ***Format*** heading describes the type or form of the work and names eight popular types, namely:

Diary (story is in diary form)
Short stories
Alternate plot (Choose-your-own-adventure type works)
Picture book
Comic strip
Letter (story is in letter form)
Abridged
Saga

Medium allows users to search for fiction works which have been translated into other popular mediums, by those alternate mediums. The authority list is:

Movie (film, video or television)
Television series
Audiocassette
Computer software

The last two headings are only used if the item is held in the school library collection in that medium.

Level indicates the reading level of the work. Works that are easy to read are placed on the left of a six place scale comprising of an exclamation mark and five full stops.

!.....

The more difficult and/or complex the work, the more the indicator is moved to the right.

.....!

Rating indicates the popularity of the fiction work. This can be determined by a variety of means such as student votes or loan rates and will always be a subjective rather than an objective measure. Works are awarded up to five stars depending on their popularity:

***** Unreal
**** Excellent
*** Recommended
** Worthwhile
* Good read

The ***Review*** is a brief synopsis of the work (both descriptive and evaluative) in the notes section. This can be a few lines drawn from the blurb or a review from a journal such as *SCAN* or *Reading Time*, but as a popular promotional device Lee recommends a student review with the student's name, class and the year the review was written attached.

Unfortunately, it is not known how widely Lee's scheme is being used in school libraries, in either its original or an adapted form. Some idea as to its potential for use can, however, be gauged through an overview of nine projects in this area which were undertaken in Spring Session, 1994 by external students in the Graduate Diploma of Education (Teacher Librarianship) course at Charles Sturt University. The nine students involved, all practising teacher-librarians, selected an optional full semester topic which required them to examine what access to fiction was currently being provided in their school library, to identify the actual and potential needs for access to fiction present within their schools, and to devise strategies practically and effectively to bridge the gap between existing and desired access to fiction. John Lee's booklet, *Providing access to treasure: Leefiction headings for school libraries* was the set text, and other information provided included Lee's conference workshop paper about his scheme and the fiction genre headings used by the Western Australian Ministry of Education.

Seven students were teacher-librarians in primary schools, one was in a K-12 school, and one was in a high school. There was a mix of government and non-government and urban and rural schools. Five of the schools had OASIS Library, one was using Prolib but was in the process of converting to OASIS Library, while the remaining three had card catalogues but will be converting to OASIS Library in 1995. While there were differences in existing access to fiction, there were also similarities. The primary teacher-librarians in particular identified themselves as a heavily used, or the most heavily used, access point to fiction by both students and teachers. This was generally viewed as a cause for concern, a general

desire being expressed to make users more self-reliant by providing them with other effective access points. Browsing, coupled with recommendations by peers, were also frequently used access points. The teacher-librarians tended to view this access as limited and inefficient.

Adaptations to the physical arrangement of fiction, such as grouping popular series together, genre stickers on fiction works and displays, were the next most frequently used access points, particularly by primary students. Some teacher-librarians saw this method of access as effective and desirable, while others were less certain. The catalogue was generally identified as an infrequently used access point for locating fiction. SCIS standard catalogue records appeared to be the norm in all the libraries. All nine teacher-librarians identified the need to provide improved access to fiction through the catalogue as a key element in providing effective access to fiction. The access to fiction provided by SCIS, while valued, was seen to be insufficent both in the number of fiction works given subject headings and in the range and diversity of access points provided.

Genre was the most strongly identified desired access point to fiction. All nine teacher-librarians saw this area as a priority for access through the catalogue. Lee's genre headings were slightly favoured over those from Western Australia, though some teacher-librarians selected terms from both lists. None hesitated to adapt the lists when they felt this would be in the best interests of their users, e.g. the teacher-librarian who was in a Christian school used the Western Australian genre headings but deleted 'Horror' and added 'Christian stories'. Some teacher-librarians expressed the concern that if SCIS altered its policy and introduced genre headings for fiction, they could be caught with different headings from other schools, but this did not deter any of the teacher-librarians from introducing genre headings.

Format was the second most desired additional access point for fiction, being selected by eight of the nine teacher-librarians. Some teacher-librarians commented that this type of access was frequently sought by students and teachers. Lee's eight designated format headings were generally to be used, though a number of the primary schools added 'Big book'.

The SCIS related headings – Issue, Era, Setting, Characters and Awards – were generally selected, but interestingly most teacher-librarians rejected Lee's liberalisation of these headings, seeing it as more important to be consistent with SCIS standards in these areas. In effect this means that where SCIS fiction subject headings are assigned, they would be used as given. The major difference would be that these SCIS standard headings would be assigned to more, or all, fiction works for which they are applicable.

Reviews were the next most popular option, with six of nine teacher-librarians indicating they would include a brief summary of the work in the notes field. Sources for these reviews included students, teachers and the teacher-librarian, as well as reviewing journals, promotional material such as Ashton Scholastic Book Club brochures, and the book's blurb. Only two of the six teacher-librarians mentioned that they would tag keywords in the review.

Five primary teacher-librarians chose Level as a heading, although none of them will use Lee's method for indicating degree of difficulty. All prefer descriptive terms, with four directing their terms at teachers, e.g. Beginning reader, Emergent reader, Developing reader and Independent reader, while the fifth targetted students using the terms Quick, Average and Long, with only Quick and Long actually being assigned to records. The secondary teacher-librarian steered well clear of level headings, declaring that they would be the 'kiss of death' in her library.

Aspect and Rating headings received little support (selected by three of nine and two of nine teacher-librarians respectively). Where they were to be employed, they tended to be closely modelled on Lee's approach.

While the small sample of opinions provided by these teacher-librarians does not in itself prove anything conclusive, it does give us a starting point from which each of us can begin to consider the need for improved access to fiction within our own school libraries.

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School Library Automation: A Select Bibliography

Ken Dillon

The items in this select bibliography are included because they mirror the issues and concerns discussed in the papers which make up this book. Therefore, readers will find a range of materials which focus on library automation surveys and directories, MARC, online catalogues, information retrieval and the educational implications of automated systems in school libraries.

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